An Analysis of the Relationships Between Six Controllable Factors and Three Measures of Quality in Forty-five Florida Secondary Schools

BY

VINCENT McGUIRE

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CHAPTER I

INTRODUCTION

In any business, from the smallest shop to the largest corporation, there is a constant evaluation of the progress of the business. The test of the success of a business is its ability to make profits, and the successful business manager does not wait until the end of the year to find out whether he is bankrupt or has made a profit. By a continuous system of accounting--including inventories, cost-profit statements, and other checks--he attempts to analyze the going state of his business in order to project his status into the future. In the field of education, however, this type of analysis is not as prevalent as it is in industry. One of the obvious reasons is that educational objectives are constantly changing with the culture and mores of the people. Also, educational objectives are not as specific and not as susceptible to analysis as those of a profit making institution. The reason for this lack of specificity is contained in the educational goals themselves. Objectives such as "wholesome attitudes," "good personality traits," and "sound character," are not easily gauged by a minutely graded measuring stick. In addition, the community, home, church, and various other institutions affect to a considerable degree the work of the school. In spite of all the aforementioned difficulties, however, educators would be grossly negligent if they did not make some effort to measure the results of a "business" that spends close to five billion dollars a year, consumes a considerable part of the lives of some thirty million pupils, and exerts a constant influence on the welfare of the total population.

Previous studies have used, in the main, two distinct types of criteria for judging the efficiency of schools. The earlier investigations utilized objective factors to determine the efficiency of schools, while more recent studies have used a check-list type of rating instrument to determine the "adaptability" and the "quality" of schools.

Ayres was the pioneer in the attempt to rate the efficiency of schools by quantitative methods. In 1920 he reported an index for the forty-eight state school systems using five non-financial and five financial factors as follows:

Non-Financial	Financial
1. Per cent of school population attending school daily	1. Average expenditure per child attending
2. Average days attended by each child of school age	2. Average expenditure per child of school age
3. Average number of days schools were kept open	3. Average expenditure per teacher employed
4. Per cent that high school attendance was of total attendance	4. Expenditure per pupil for purposes other than teachers' salaries

5. Per cent that boys were of girls in high school	5. Expenditure per teacher for salaries[1]

Computing an index number for each state by weighting the non-financial factors Ayres determined the relative standings of state school systems for 1890, 1900, 1910, 1916, and 1918. In addition, he found a correlation of .78 between his index of efficiency, composed of the five non-financial factors listed above, and the sum of the financial factors for each state during the year 1918.[2]

In 1922 Frasier attempted to determine the best method of fiscal control for city school systems. While his chief topic of investigation has no direct bearing on this study, Frasier's use of certain factors to determine the quality rank of schools is of interest. The six factors listed below were used to compute an educational index number.

1. The per cent of sixteen and seventeen year old children in school.
2. The per cent of elementary classes having fewer than forty children enrolled.
3. The per cent of children who have 60 sq. ft. or more playground space.
4. The per cent of teachers who have six or more years training above the eighth grade.
5. The per cent of children enrolled who attend school all day, and in adequate buildings owned by the city.

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[1] L. P. Ayres, _An Index Number for State School Systems_, pp. 14-15.

[2] _Ibid._, p. 55.

6. The per cent of the increased cost of living from 1913-14 to 1919-20 that was met by increased salaries for elementary women teachers.[1]

It is noteworthy that of the six factors used by Frasier, the first and part of the fifth are similar to those used by Ayres for measuring what is commonly known as "holding power."

Dawson's study, in 1927, was concerned with formulating standards of expenditures for principal items of city school costs. In order to base his standards for expenditures on the financial practices of the more efficient school systems, Dawson rated school efficiency on the following quantitative measures:

1. The percentage of school enrollment in average daily attendance.
2. The number of teachers per pupil.
3. The percentage of population 15 to 19 years old in average daily attendance in high school.
4. The ratio of high school average daily attendance to elementary school average daily attendance.
5. The percentage of population 7 to 17 years old attending school.
6. The drawing power of the school as measured by the ratio of boys to girls, or vice versa, attending high school, calculated on the basis of the ratio of boys to girls, or vice versa, in the population of high school age.[2]

Again, the factor of holding power as a means of determining school efficiency is quite evident. All the factors listed above, with the exception of number 2, can be classed as measuring the holding power of the schools. With respect to the relationship between an index of school efficiency and total educational expenditures, Dawson said:

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[1] G. W. Frasier, The Control of City School Finances, p. 68.

[2] H. A. Dawson, Standards of Expenditure for the Principal Items of City School Costs, p. 11.

> There is a marked degree of relationship between school efficiency as measured in this study and total current school expenditures (omitting capital outlay, debt service, and night schools) as is shown by the coefficient of correlation, r=.39.[1]

Dawson's findings, then, in connection with the relationship between school cost and efficiency, are in line with those reported in previous studies.

An investigation of the relationship between current expenditures and certain measures of educational efficiency was made by Ferrell in 1936. Ferrell's study dealt with county and independent graded-school systems in Kentucky and indicates a broadening view of quantitative factors for determining school efficiency. He used the following measures:

1. Per cent average daily attendance is of the census.
2. Holding power, measured by the sum of (a) per cent eighth grade enrollment is of first grade enrollment and (b) per cent high school enrollment is of the total public school enrollment.
3. Per cent of teachers employed who have a given amount of preparation.
4. Per cent of teachers employed who have had three or more years of teaching experience.
5. Per cent the number of teachers is of the number of pupils.

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[1] _Ibid._, p. 16.

6. Per cent the number of days in the elementary school term is of 200 days.[1]

The first two measures listed above are measures of holding power which seems to hold a consistent place in any investigation using objective factors to measure school efficiency. The other measures, however, indicate a realization that the professionalization of teachers, teaching experience, class size, and length of school term are sharper measuring devices than those used by early investigators. Ferrell's study is particularly noteworthy in that he computed zero-order and partial correlations between each of his six factors of educational efficiency and per capita expenditures for general control, instruction, operation of plant, maintenance of plant, auxiliary agencies, and fixed charges. Even with the limitations[2] Ferrell acknowledged, his method of attack is more refined in that he attempted to "pin point" those areas where certain relationships exist between school efficiency and expenditures. Ferrell concluded that a very definite relationship exists between total current expenditures and educational efficiency.[3]

Other studies which involved the rating of school efficiency were made by Phillips, Burton, Turner, Adams, and Jaggers. Phillips[1] used a total of seven non-financial factors, four of which can be classed as measures of holding power. Burton's[2] study included seven non-financial factors, three of which measure holding power. Five of Turner's[3] six factors pertain to holding power. Although Adams[4] measured thirty-six factors, only eight are of a non-financial nature and six of these deal with holding power. Of Jaggers'[5] four factors three relate to holding power.

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[1] D. T. Ferrell, Relation Between Current Expenditures and Certain Measures of Educational Efficiency in Kentucky County and Graded-School System, p. 21.

[2] Ibid., p. 5.

[3] Ibid., p. 89.

All in all, in twelve studies[6] which employ objective factors to measure school efficiency, eighty-eight different components were used. Forty-one are non-financial factors, of which twenty factors are measures of holding power. It is interesting to note the paucity of factors used to rate schools according to student achievement. Three earlier studies include some measure of student achievement. Harrell used "per cent of those taking the regents examinations who passed them."[1] Brown included factors which compute "the annual expectation graduating from the eighth grade"[2] and similarly for high school. Turner included a measure of "per cent of the total enrollment in normal grade or above for age."[3] Since the mental ability of the students was not taken into account, some question may be raised as to whether these factors give a valid measure of the effectiveness of classroom instruction.

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[1] F. M. Phillips, "Educational Rank of States, 1930," American School Board Journal, LXXXIV (February, March, April, May, 1932), pp. 25-29; 37-39; 29-30; 39-40.

[2] A. C. Burton, A Study of Education in Rural and Urban States, p. 56.

[3] H. L. Turner, Tentative Standards for the Distribution of Expenditures in County School Systems in the South, pp. 1-20.

[4] J. E. Adams, A Study in the Equalization of Educational Opportunities in Kentucky, pp. 1-5.

[5] R. E. Jaggers, Budgetary Procedures in County School Systems in Kentucky, pp. 1-4.

[6] Ferrell, op. cit., pp. 100-106.

Recent Studies

A different trend in measuring the quality of schools is evidenced in several more recent investigations. In determining the degree of "adaptability" of the schools and the "educational background" of thirty-six Pennsylvania communities in 1941, Mort and Cornell[4] used two measuring instruments. A Guide for Self-Appraisal of School Systems was used to determine the adaptability of the schools and the McCall

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[1] New York Tax Commission, A Report of the Special Joint Committee on Taxation and Retrenchment, pp. 65-67.

[2] E. E. Brown, A Statistical Survey by Counties of Education in Oklahoma, p. 62.

[3] H. L. Turner, op. cit., pp. 1-20.

[4] P. R. Mort and F. G. Cornell, American Schools in Transition, p. 89.

Educational Background Questionnaire measured the educational background of the communities. The two major questions investigated by Mort and Cornell were as follows:

> (1) How far does American education lag behind standards generally accepted as desirable and (2) How can we speed up the adoption of practices which are generally accepted as desirable in the light of experimentation, research, and prolonged consideration?[1]

Here is evidence of a new measuring technique and a new measuring device. Instead of using objective factors such as enumeration data employed in earlier studies and making the assumption that the quality of the schools is commensurate to the fulfilment of those factors, the more recent studies base qualitative rating of schools on observable educational practices that are generally accepted as being the best. An explicit explanation of what the Guide measures is as follows:

> This instrument is designed to serve as a basis for the appraisal of individual school systems with respect to their adaption to current educational needs which differ from those of past generations as a result of economic and social developments or of improved understanding arising from the progress of educational science.
>
> If the superintendent wishes to appraise his school system in terms of the extent to which it has responded to advances in educational practice this manual will be an adequate guide since the items included in it have been selected with reference to the extent to which they are symptomatic of the best practices found in the school systems.[2]

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[1] Ibid., p. v.

[2] Mort and Cornell, A Guide for Self-Appraisal of School Systems, p. iii.

The ability to adapt to ever-changing cultural, social, and economic aspects of life is an important one. In industry a great deal of money is spent on research so that the necessary adaptive processes can be made with as much foresight as possible and with a minimum of financial effort. Since the school is an institution for preparing youth for the world by providing the type of experiences most beneficial to them, the school must possess adaptability to a great extent. In the Pennsylvania study Mort and Cornell concluded that current expenditure is closely related to the adaptability of the school.[1]

In order to determine the school practices which occur more frequently in better supported schools than in less supported schools, Vincent analyzed ten low expenditure schools and eight of the high expenditure schools.[2] He based his analysis of schools on three things: (1) reports based upon the Guide filed by participating school systems; (2) checklists based upon the Guide filed by field workers who visited schools; (3) annual reports of school systems to the State Department of Education.[3] With the assumption that "schools which are making provisions to achieve these objectives are superior to schools which do not make such provisions."[1] Vincent's general conclusion is that in most cases the high expenditure schools follow the better educational practices.[2]

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[1] Mort and Cornell, American Schools in Transition, pp. 178-185.

[2] W. S. Vincent, Emerging Patterns of Public School Practice, p. 40.

[3] Ibid., p. 20.

It might be well to inject the comment here that the users of check-list rating devices shy away from the use of standardized tests, as did the earlier investigators of school efficiency. Vincent made the following statement in regard to standardized tests:

> Teachers in middle expenditure schools make great use of these devices; at the high level their use tends to drop off. The skill of the master teacher is always centered upon the individual pupil. What such a teacher knows about a given individual is far greater than a measure on a standardized test could supply.[3]

What Vincent said about standardized tests is probably true. It is well, however, that he qualified his statement by using the term "master teacher." It goes without saying that the per cent of "master teachers" is not a major one. In fact, Vincent admitted this when he said:

> The use of the specialist is another example of a patent device. Middle expenditure schools tend to employ more of these and for more varied services than do high expenditure schools. Teachers in the latter, possibly because they have had more special as well as more general training than the average teacher, rely less upon such special services.[4]

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[1] Ibid., p. 14.

[2] Ibid., pp. 50-56.

[3] Ibid., p. 53.

[4] Ibid.

McClure's study of 1948 dealt with the investigation of three major questions in his analysis of financial support of Mississippi public schools. What kind of education is being obtained for the money spent? How is the money being spent? How can the financial support of schools be improved?[1] His procedure for judging the quality of schools consisted of committee ratings with reference to 200 practices "generally recognized as being essential to good education."[2] McClure then compared schools of four expenditure-per-pupil groups: $175, $100, $80, and $50. His general conclusion is that "as citizens spend more money on their schools they may expect corresponding improvements. . . ."[3] The committees that rated the schools used the Mort-Cornell Guide to judge the quality of the schools.

In 1949 Woollatt made a study of the "cost-quality relationship" in a group of "fiscally favored schools."[4] The purpose of his investigation was "to make an analysis of the cost-quality relationship in high expenditure schools, taking into account such factors as regional differences, community differences, and staffing differences."[5] The other analysis made by Woollatt was in regard to each of the four phases of The Growing Edge.[1] The Growing Edge is a check-list rating type of instrument with spaces provided for the observer to write in observed school practices as evidence of the rating. The title of this instrument refers to newly originated educational practices which can be considered on the "frontier line" or the "growing edge" of educational advancement. In order to rate new educational practices, Woollatt used the four areas of basic skills, knowledge, special aptitudes, and gross behavior patterns. His conclusions in regard to these four areas, are generally favorable for high expenditure schools.

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[1] W. P. McClure, _Let Us Pay for the Kind of Education We Need_, p. 2.

[2] _Ibid._, p. 4.

[3] _Ibid._, p. 29.

[4] L. H. Woollatt, _The Cost-Quality Relationship on the Growing Edge_, p. 30.

[5] _Ibid._, p. 36.

In the area of basic skills Woollatt claimed that in high expenditure schools, "the use of lifelike situations and of variety in teaching basic skills does improve."[2] Although his investigation revealed that increased expenditure results in an increase in the area of knowledge, Woollatt cautioned that "schools just below average expenditure may expect to find a critical point at $150 per pupil where no improvement takes place in teaching the areas of knowledge. This plateau comes to an end at about $170 per pupil."[3]

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[1] P. R. Mort, W. S. Vincent, and C. A. Newell, The Growing Edge; an Instrument for Measuring the Adaptability of School Systems, p. 31.

[2] Woollatt, op. cit., p. 57.

[3] Ibid., p. 60.

Woollatt's conclusions in relation to special aptitudes of individuals indicate that in the lower ranges of high expenditure "increasing returns in special aptitude discovery are secured even under average staffing characteristics; but that in the upper regions of expenditure, increasing returns are accompanied by very favorable staffing characteristics."[1] The most significant remark of all is the following:

> Schools spending from $155 to $170 appear to be losing ground in the discovery of special aptitudes, because of reliance on classroom teachers without sufficient assistance from school specialists.[2]

It is rather difficult to reconcile this quotation with the one from Vincent's study on page 11 (footnote 4) of this investigation. Perhaps this dilemma of "to use or not to use specialists" stems from the technique of both investigators of using money as a causative factor of quality. All in all, it is only logical to expect better conditions to exist where more money is spent. To measure educational quality on the basis of an increase of $15 per student, however, seems to credit money with an incredible amount of magical power. In the area of gross behavior patterns, Woollatt concluded that the evidence indicates that higher expenditure will bring about additional educational returns.[3]

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[1] _Ibid._, p. 63.

[2] _Ibid._

[3] _Ibid._, p. 64.

Summary

All previous studies indicate a fairly close relationship between school expenditures and educational quality, but no study, with the exception of Ferrell's, makes an analysis of the factors involved in this relationship. Ferrell's study appears to be the first attempt at analyzing the factors involved in cost-quality relationship of schools. He, however, made the assumption that the presence of certain objective factors indicate educational efficiency and then analyzed the relationship between the factors and the money spent on education. Rather than first spending the money and then finding what relationship exists between the amount of money spent and the educational returns, it would seem more logical to select those factors which can be administratively controlled and analyze the degree of relationship of these factors to certain measures of quality. In this way it could be determined which factors need financial or administrative bolstering and which factors appear to be operating at full strength. Such an analysis would be valuable for determining the points of emphasis for improvement in a given group of schools at a given time. This type of approach would be more in keeping with the "prudential principle" of school finance expressed by Mort and Reusser as follows:

> Whatever may be the reason for the increased cost of education, souhd measures of economy are always in order, but it is a question as to just what constitutes economy under given conditions.

> It is at this point that prudence and the best judgement of school officials must enter to make their program of education as efficient as possible and at the same time to save the taxpayer's money.[1]

In summary, previous studies employed three general types of criteria to measure the efficiency or quality of schools; namely, (1) statistical analysis of objective factors such as enumeration data, (2) student achievement, and (3) check-list rating instruments.

The statistical analysis type of approach was used to measure school efficiency by analyzing certain factors assumed to be closely related to school efficiency; for example, the training of the teachers, the number of days in the school term, the amount of playground space per child, school expenditure, and similar factors.

The student achievement type of measurement rated school quality on the academic achievement of the pupils.

The check-list rating method relied on the judgment of professional educators as to the use of acceptable educational practices in the school.

That the three foregoing methods of attack are good ones cannot be denied. No study was found, however, that used all three methods for measuring educational quality. While it is true that no one investigation could adequately cover all the quality phases of a school program, a more comprehensive type of quality measure would lend more validity to such a study.

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[1] P. R. Mort and W. C. Reusser, Public School Finance, p. 103.

The study described in succeeding paragraphs will utilize the three methods of attack mentioned above and determine the degree of relationship existing between certain controllable factors that have been assumed to be closely related to school efficiency, and three separate quality criteria.

Purpose of the Study

The purpose of this study is to analyze the relationship between the quality of forty-five Florida secondary schools, as measured by three separate criteria, and six controllable factors which are commonly assumed to affect quality. In order to investigate this problem an attempt will be made to answer the following questions:

1. What degree of relationship exists between school quality as determined by ratings based on the Evaluative Criteria and Educational Temperatures - 1940 Editions[1] and (1) average salary of the teachers, (2) teacher certification, (3) scope of the educational program, (4) school size, (5) quality of administration, and (6) condition of the plant facilities?

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[1] Cooperative Study of Secondary School Standards, Evaluative Criteria and Educational Temperatures - 1940 Editions: Sections D, E, G, H, and I.

2. What degree of relationship exists between school quality as determined by holding power and each of the six factors listed above?
3. What degree of relationship exists between school quality as determined by an index of achievement of the students and each of the six factors listed above?

Scope

The investigation includes forty-five secondary white schools located in twenty-four of Florida's sixty-seven counties. Based on the formula for determining each county's per cent of the state total of certain financial factors,[1] these twenty-four counties range from the first to the sixty-sixth in wealth.

The sizes of the schools as measured by student membership range from 126 to 2,358. The high school plans of organization of these schools are as follows: five three-year schools, five four-year schools, two five-year schools, and thirty-three six-year schools.

The American Council Tests were used to measure mental ability, and Cooperative Tests were used in the four subject matter areas of English, social studies, mathematics, and natural science. In the forty-five schools investigated, 4,428 seniors took tests in these areas.

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[1] Florida School Laws, as amended by Committee Substitute for House Bill No. 146, Chapter 23721, No. 112, Section 242.05(2), p. 43.

Sources of Data

The data used in the study are taken from the following sources: (1) records of the Evaluative Criteria and Educational Temperatures - 1940 Editions on file at Florida State University; (2) records of the 1949-50 principals' Report on School Organization and Personnel on file in the State Department of Public Instruction; (3) records of the Board of University Examiners on the 1949-50 American Council and Cooperative Tests; and (4) general literature in the field of school evaluation.

Limitations of the Study

The use of the Evaluative Criteria records necessitates including only those schools that are accredited members of the Southern Association of Colleges and Secondary Schools and that have been evaluated by the 1940 edition of the Evaluative Criteria. This limits the number of cases to forty-five. Although this number does not constitute a representative sample of Florida schools, the limitation is not a severe one since any conclusions reached in an investigation of this nature should apply only to those schools involved in the study. As Chisholm so aptly phrased it:

> There has been a tendency for school people to assume that the findings of the foregoing studies [relating to school expenditure and efficiency]

> apply equally as well to all schools. It would seem more defensible in the absence of additional research to assume that the findings of the Metropolitan studies, and similar studies, therefore, hold only for the schools involved and other schools operating under similar circumstances. Aside from the research point of view involved, there are practical reasons for due caution in making a wider application of the findings than are actually warrented by the data presented in support of the conclusions.[1]

Since school quality is a nebulous thing at best, the limitations of the quality criteria are necessarily narrow. The three quality criteria selected measure only what they are supposed to measure--holding power, acceptable educational practices, and student achievement with allowances made for mental ability.

Since the schools involved in the study are accredited members of the Southern Association of Colleges and Secondary Schools, they have already met certain minimum standards of the Southern Association.[2] Therefore, a wide range of quality and of differences in the controllable factors is not to be expected. The coefficients of correlation, consequently, will probably be lower than those which would have been obtained if all 305 Florida secondary schools had been rated.

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[1] L. L. Chisholm, "The Relationship Between Financial Expenditures and the Effectiveness of the Educational Program: Some Neglected Facts," p. 2. A paper presented at the St. Louis meeting of the American Educational Research Association, February 28, 1949.

[2] Southern Association of Colleges and Secondary Schools, Standards of the Commission on Secondary Schools, 1949-50.

CHAPTER II

SELECTED CRITERIA FOR RATING THE QUALITY OF SECONDARY SCHOOLS

Since this investigation proposes to determine the extent of existing relationships between six controllable factors and three separate phases of school quality, it is necessary to select those phases of quality which are included in the major objectives of public school education and which can be quantitatively analyzed. Succeeding paragraphs are presented to justify the choice of the criteria used and to indicate the procedure for gathering the data.

Holding Power

No matter what educational objectives teachers hope to accomplish in the classroom, it is well nigh impossible to achieve to its fullest any educational goal if the students drop out before completing high school. The democratic philosophy of educations calls for educating all youth, not just a select group. With regard to this fundamental objective, former U. S. Commissioner of Education, Studebaker made the following comment:

> It has long been a cherished hope of the American school system to make secondary education quite as much the common heritage of youth as elementary education. To make this ideal a reality, much hard work has been done --many careful studies of the problems involved have been made; intriguing plans and objectives have been formulated; daring experiments have

> been undertaken; promising programs of action have been proposed. Despite these widespread efforts to universalize secondary education and the very significant progress in this direction already made, statistics for 1943-44 reveal that only about 7 youth out of 10 enter senior high school and fewer than 4 of them remain to graduate.[1]

Further evidence of the importance of this problem is indicated in the findings of the Work Conference held in Chicago in 1950. Leaders in public education presented the following information:

> A late estimate based on Federal census data indicates that there are in the United States in 1950, 1,741,000 youth from 12 through 17 years of age who are not in school despite some evidence that elimination from school is currently decreasing somewhat; unless the trend is sharply checked, it is estimated that the figure quoted from 1950 could increase to 2,504,000 by 1960.[2]

What are the reasons for these drop outs? Why are the schools so lacking in holding power? How do the students who quit school sum up their reasons? Dillon's investigation sheds a great deal of light on the foregoing questions. His general findings indicate that "in the average public school system, 50 per cent of the students who enter high school drop out before graduation."[3] Making a follow up study of over 1,000 drop outs, Dillon found the following reasons[1] to be of first importance among students who quit school:

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[1] U. S. Office of Education, Life Adjustment for Every Youth. Introduction by J. W. Studebaker, p. iii.

[2] U. S. Office of Education, Why Do Boys and Girls Drop Out of School, and What Can We Do About It?, p. 36.

[3] H. J. Dillon, Early School Leavers: A Major Educational Problem, p. 9.

Reasons	Frequency Per Cent
Preferred work to school	36
Was not interested in school work	11
Could not learn and was discouraged	7
Was failing and did not want to repeat grade	6
Disliked a certain teacher	5
Disliked a certain subject	3
Could learn more out of school than in school	1

The data listed above indicate that 69 per cent of the reasons for leaving school are specifically related to the school. In order to find out the relationship between the first and the second reasons given for leaving school by those who "preferred work to school" as the first reason, Dillon tabulated the reasons of secondary importance of this particular group and discovered that 39 per cent of them were related directly to the school.[2] All in all, grouping the various reasons under "school," "financial," and "personal," Dillon found that those relating to school occurred 63 per cent of the time, those relating to financial constituted 26 per cent of the cases, and those relating to personal occurred 11 per cent of the time.[3] Dillon summed up his investigation with the following comment:

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[1] *Ibid.*, p. 50.

[2] *Ibid.*, p. 52.

[3] *Ibid.*, p. 53.

> This seems to leave little doubt that of all the factors that are important in motivating a youth to leave school, those that reflect dissatisfaction or difficulty in school lead in importance.[1]

School drop outs then is one of the major problems schools face today, and the schools succeed in solving the problem to the extent that they are capable of offering educational programs of greater value, interest, and meaning, to attract and to hold high school students. One criterion by which a school may be judged, therefore, is its holding power. The judges in this case are the students themselves.

In order to determine the holding power of the schools investigated in this study, Section C, "Pupil Population and School Community," of the Evaluative Criteria was used. This method allowed a more precise measurement than some of the earlier methods of determining holding power (e. g., per cent that boys were of girls in high school and per cent the high school enrollment was of the total public school enrollment) in that the data used constituted the actual number of withdrawals "from school in the 12 months preceding the opening of school for the current 1949-50 year,"[2] and included students "who did not return after the summer vacation."[3] At first, it was planned to use only those reasons for withdrawal that related directly to the school. After reviewing the total data and noting the large per cents in the "other reasons" and "unknown" categories, it was decided to compute all the withdrawals except those in the "graduated" or "family moved away" class. Table 1 below indicates the results found in

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[1] Ibid., pp. 53-54.

[2] Cooperative Study of Secondary School Standards, op. cit., p. 20.

[3] Ibid.

TABLE 1

TOTAL WITHDRAWALS OF NON-GRADUATES FROM
45 SECONDARY SCHOOLS, 1948-49

Reason	Number	Per cent of Total Withdrawals
Poor scholarship	120	3
Lack of interest in school work	215	5
Disciplinary difficulties	42	1
Family moved away	2,431	53
Financial reasons	33	1
Illness of pupil	116	2
Pupil's help needed at home	70	1
Marriage	278	6
To go to work	390	8
Other reasons	588	13
Unknown	310	7
Total	4,593	100

this phase of the investigation and includes "family moved away" figures to show the unique problem of student body instability that is indigenous to a tourist state such as Florida. These figures, however, will not be included in the final computation of holding power. Per cents have been rounded off to whole numbers. The large amount-- 20 per cent-- of students who withdrew for "other reasons" and "reasons unknown" indicates the lack of adequate guidance and record keeping on the part of the schools involved.

In computing the holding power for each of the schools, the per cent of membership which dropped out was subtracted from 100 and the resulting figure indicates the holding power of the school. Final figures were rounded to achieve whole numbers. Table 2 shows the holding power figures for the forty-five schools used in this study. The median for the schools is 92 per cent; this means that in those schools obtaining the median rating 92 per cent of the membership either remained in school, graduated, or moved out of the school community.

TABLE 2

FREQUENCY OF HOLDING POWER PER CENTS IN 45 SECONDARY SCHOOLS, 1948-49

	Holding Power Per Cents	Frequency
	100	1
	99	1
	98	1
	97	4
	96	-
	95	4
	94	4
	93	7
	92	3
	91	3
	90	4
	89	3
	88	3
	87	5
	86	2
Median	92	

Evaluative Criteria

There is no one quotation, paragraph, or book that could summarize the specific aims of public school education and have those aims hold true for any great length of time. The reciprocity between society and the educational system is reflected in the changing emphasis on educational objectives as reviewed in reports of national committees. The "Committee of Ten" met in 1892 in order to study the problem of standardizing high school programs to conform to college requirements. In 1918 the "Commission on the Reorganization of Secondary Education" listed the seven cardinal aims of education, which objectives were far more inclusive than the comparatively easy aims of 1892. In 1935 the "Educational Policies Commission" emphasized the purposes of education in a democracy. Thus it can be readily seen that educational leaders have been continually concerned with adjusting the educational program to meet the needs of an ever-changing society. In discussing "The Criteria of Good [educational] Aims" Dewey pointed out that "the aim set up must be an outgrowth of existing conditions. It must be based upon a consideration of what is already going on; upon the resources and difficulties of the situation."[1]

Living and learning in a democracy might be compared to driving an automobile. Sometimes the steering wheel can be held fixed for a stretch of straight road, but the speed must be governed by the condition of the road. Sometimes there are curves to go around, hills to climb and go down, foul weather to contend with, and the amount of gasoline in the tank to take into consideration. There are no hard and fast rules which can be followed; instead the driver must plan his trip in light of the existing conditions related to his itinerary and then use his judgment as unforeseeable events occur during the trip. Yet with all these unforeseeable factors there are certain rules of driving which are derived from research and past experience that minimize the possibility of accidents and develop to an optimum the enjoyment and value of automotive transportation. So it is with public schools. It would indeed be wonderful for measuring purposes, to have a fixed curriculum with rigid requirements for school admission and for graduation. If the sole aim of public education were to turn out graduates skilled in the fundamentals of the three "R's," the results of school programs would be infinitely easier to measure. When the educational aims include training for a democracy, however, measuring the quality of schools is comparable to measuring the democracy content of various communities in the United States. President Conant of Harvard succinctly stated the problem in the following quotation:

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[1] J. Dewey, Democracy and Education, p. 121.

> Roughly speaking, the basic argument about general education turns on the degree to which the

> literary and philosophical traditions of the western world, as interpreted by scholars and connoisseurs before World War I, should be the basis of the education of all American youth. The watershed between two fundamentally opposed positions can be located by raising the question: For what purpose do we have a system of public education? If the answer is to develop effective citizens of a free democratic country, then we seem to be facing in one direction. If the answer is to develop the student's rational powers and immerse him in the stream of our cultural heritage, then we appear to be facing in the opposite direction.[1]

It can be easily seen that if the first educational aim listed in the foregoing quotation is to be achieved, there must be constant revision of the school program in order to keep pace with the constantly changing democratic order. Mort and Cornell termed this need for meeting changes "adaptability."[2] Conant called it "fluidity."[3] Whatever term one wishes to apply, "static" will be the best antonym for it. Yet there are certain common elements of school practices adherence to which will further students' progress toward the characteristic goals of a democracy. In order to derive these common elements and formulate criteria for evaluating secondary schools, four of the six regional associations of colleges and secondary schools formally organized, in 1933, the "Cooperative Study of Secondary School Standards."

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[1] J. B. Conant, Education in a Divided World, pp. 74-75.

[2] Mort and Cornell, American Schools in Transition, p. XXI.

[3] J. B. Conant, op. cit., p. 59.

The Cooperative Study group insisted that "each secondary school had the right and duty to formulate its own philosophy of education and to make an explicit statement of aims and purposes in harmony with this philosophy."[1] Those making the study, however, believed that a great service could be rendered toward the improvement of education in the secondary schools if they "attempted to present a sanely progressive statement of guiding principles as a general guide to educational thought and practice in the field of secondary education."[2] The study group felt that a school could decline to accept the statement of principles but should be able to state why it disagreed and justify its position. A compilation of "the most nearly valid principles and facts which might serve as bases for criteria to be used in evaluating, stimulating, and improving the secondary school program"[3] was made on the basis of abstracts of approximately 2,500 research studies in education. This compilation was then sent for critical analysis to 500 collaborators, among whom were national leaders in secondary education, specialists in secondary education in state departments, professors of secondary education in leading universities, groups of graduate students in education, school librarians, and classroom teachers. All summaries, criticisms, and suggestions received from collaborators were analyzed further by a special committee of educational leaders. After revision a tentative copy of the Criteria was printed and used in 200 try-out schools. In addition to using the Evaluative Criteria for rating these schools, the committee applied the following six measures: judgment of field committees, progress as measured by standard tests, college success of pupils, non-college success of pupils, judgment of pupils, and judgment of parents. In order to ascertain the relative weights of all seven measures, the principals of the 200 schools, members of the full-time field staff, third members of visiting committees, the General Committee, and the office staff were asked to designate a relative value for each of the measures. A summary of the findings was made and weights[1] assigned as follows:

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[1] Cooperative Study of Secondary School Standards, Evaluation of Secondary Schools, p. 40.

[2] Ibid.

[3] Ibid., p. 65.

Evaluative Criteria	40
Committee Judgment	20
Test Results	20
College Success	10-1
Non-College Success	0-9
Pupils' Judgment	6
Parents' Judgment	4

A single composite rating of the relative excellence of the schools was made and validity coefficients of correlations were computed between the composite score and each of the seven measures. The following correlations[2] were obtained:

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[1] Ibid., p. 151.

[2] Ibid., p. 434.

Composite score and Evaluative Criteria	.901
Composite score and Committee Judgment	.875
Composite score and Testing Program	.400
Composite score and College Success	.074
Composite score and Non-college Success	.180
Composite score and Pupil Judgment	.313
Composite score and Parent Judgment	.292

The study group acknowledged a substantial amount of self-correlation in the method used. For example, the correlation between the total score on the standard test and the detailed evaluations in the Evaluative Criteria was .04-.05.[1] When the tests were given a weight of 20 and used in a single composite measure and when the results of the tests were then correlated with the composite rating, the correlation jumped to .40. Similarly, other validation coefficients were benefited by self-correlation.

The only study on record relating to the reliability of the Evaluative Criteria is the Hawkins' investigation.[2] Hawkins summarized his study with the following comments:

> The following procedure was used in this study: (1) Two entirely different committees (A and B) were selected to visit each school. (2) Separate, experienced chairmen were used. (3) Simultaneous visits and evaluations were made by the committees. (4) Complete duplicate sets of "Evaluative Criteria" were furnished. (5) The committees were equated _in general_. (6) The committees operated independently. They met together at the beginning of the visit, but no conference was carried on between the two committees during the visit. Separate conferences

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[1] _Ibid._, p. 296.

[2] E. T. Hawkins, "The Reliability of Secondary School Evaluations," Unpublished Doctoral Dissertation, Yale University, 1942.

> were held with pupils, teachers, etc.
>
> Twenty-five schools in eleven states were involved in the study. The enrollment of the schools ranged from 75 to 2,500. One was a parochial school, two were private schools, and twenty-two were public schools. The types were: junior high, three-year senior high, four-year senior high, five-year high, and six-year high.
>
> Five-hundred seventy-nine persons served on the fifty committees in the twenty-five schools. Principals, teachers, university faculty members, state department officials, and classroom teachers were included on the committees. The size of the committees ranged from thirteen (6 on one and 7 on the other) to seventy-three (more than 35 on each of the two committees).[1]
>
> Each of the nine areas of the Evaluative Criteria showed significant Correlation between judgments of the two sets of committees when analyzed by either the rank difference or the product-moment method of correlation. Correlations ranged from plus 62 in Curriculum to plus 95 in School Plant and in each case the corresponding probable error was less than 1/6th of the coefficient of correlation.[2]

The foregoing evidence indicates a fairly high reliability for committee judgment. Since the evaluating committees in Florida were composed in a manner similar to those described by Hawkins, it is assumed, therefore, that the data in this investigation are sufficiently reliable to be usable.

The preceding outline of the development of the Evaluative Criteria is presented in order to show the philosophy behind such a measuring technique and to indicate the trend of emphasizing good school practices as a means of evaluating schools. The second criterion by which the quality of a school may be judged, therefore, is its use of acceptable educational practices. The judges in this case are professional educators.

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[1] Hawkins, The Evaluative Criteria and Evaluation Practices, pp. 5-6.

[2] Ibid., p. 6.

In evaluating the forty-five schools in this study, it was decided to rate that phase of the school known as the "educational program." The study group advised that any evaluation of an educational program should be made "in terms of six principal elements: -- the curriculum and courses of study, pupil activities, the library, guidance, instruction, and outcomes."[1] After analysis of forty-five criteria records, it was discovered that the check-list for "Adequacy of Library Materials" in Section F, "Library Service," was not uniformly filled out. In some cases the committee had completely filled out the sheet, in other cases it was partially completed, and in a few instances it was neglected entirely. It was decided, therefore, to eliminate this section from the data used to rate a school's educational program.

In rating the educational program of the forty-five schools, the following procedure was used. Tally cards for the five elements of the educational program were made, with numerical headings from 1 through 5, and the committees' ratings given each phase of each of the five sections were tabulated. The rating scale used by committees is as follows:

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[1] Cooperative Study of Secondary School Standards, op. cit., p. 44.

5. - Very superior; the provisions or conditions are present and functioning to the extent found in approximately the best 10% of regionally-accredited schools.
4. - Superior; the provisions or conditions are present and functioning to the extent found in approximately the next 20% of regionally-accredited schools.
3. - Average; the provisions or conditions are present and functioning to the extent found in approximately the middle 40% of regionally-accredited schools.
2. - Inferior; the provisions or conditions are present and functioning to the extent found in approximately the next 20% of regionally-accredited schools.
1. - Very inferior; the provisions or conditions are present and functioning to the extent found in approximately the lowest 10% of regionally-accredited schools.
N. - Does not apply. (When this symbol is used, explanation as to the reason the section does not apply should be given under Comments.)[1]

A grand average for the five sections (curriculum and courses of study, pupil activities, guidance, instruction, and educational outcomes) was computed to the first decimal place and this figure represents the quality rating of the school. It should be emphasized that the visiting committee's ratings were used and not the original rating of the school being evaluated. While a few original ratings were raised by the visiting committees, the majority of revisions lowered the rating schools gave themselves. Table 3 shows the average scores made by the forty-five schools in the five elements that constitute the educational program. Table 4 shows the final average quality rating of each of the forty-five schools investigated.

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[1] Cooperative Study of Secondary School Standards, op. cit., "Instructions" for Sections D through L.

TABLE 3

FREQUENCY OF EVALUATIVE CRITERIA RATINGS FOR FIVE PHASES OF THE EDUCATIONAL PROGRAM IN 45 SECONDARY SCHOOLS

Quality Rating	Frequency				
	Curriculum and Courses of Study	Pupil Activity Program	Guidance Service	Instruction	Outcomes of the Educational Program
4.3	1				
4.2					
4.1	1	1			
4.0		1		1	1
3.9	2	1	1	1	
3.8		4		1	
3.7	2			4	
3.6	1	3	2	5	1
3.5	3	4	1	5	
3.4	3	4	2	10	5
3.3	7	4	4	8	7
3.2	4	2	3	4	5
3.1	5	4	2	2	8
3.0	7	5	2	1	6
2.9	2	4	1	1	4
2.8	4	2	5	1	1
2.7		2	3		4
2.6			2	1	2
2.5		1	1		
2.4	1		3		
2.3	2		3		
2.2		2	1		
2.1			4		1
2.0		1			
1.9			3		
1.8					
1.7			2		
Averages	3.2	3.2	2.7	3.4	3.1

TABLE 4

FREQUENCY OF AVERAGES OF THE EVALUATIVE CRITERIA RATINGS FOR THE EDUCATIONAL PROGRAM IN 45 SECONDARY SCHOOLS

	Quality Rating	Frequency
	3.6	1
	3.5	6
	3.4	3
	3.3	9
	3.2	4
	3.1	4
	3.0	5
	2.9	6
	2.8	1
	2.7	2
	2.6	1
	2.5	3
Average	3.1	

As pointed out previously, the forty-five schools are to some extent a homogeneous group since they have met the accredidation requirements of the Southern Association of Colleges and Secondary Schools. Therefore, the range in quality is not a large one. The average rating for all schools is 3.1.

Index of Achievement

In the preceding pages of this investigation evidence has been presented to show the need for schools to evaluate constantly their educational objectives and adjust them to existing conditions. There is one objective, however, that seems to hold a high degree of permanency despite changing conditions, and that is the objective of teaching the basic skills in the fundamental subjects. In the Report of the Commission on Reorganization of Secondary Education of the National Education Association this objective was termed "command of the fundamental processes."[1] The Educational Policies Commission included effective reading, writing, and arithmetic in the objective of "Self-Realization."[2] Vincent phrased one objective as "the teaching of the tools of learning--reading, writing, numbers, and other skills."[3] The Florida Citizens Committee recommended that "continued attention should also be given to the 'three R's.'"[4] The Cooperative Study group said the following:

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[1] National Education Association, Commission on Reorganizing Secondary Education, Cardinal Principles of Secondary Education, p. 11.

[2] Educational Policies Commission, The Purposes of Education in American Democracy, p. 50.

[3] Vincent, op. cit., p. 13.

[4] Florida Citizens Committee on Education, Education and the Future of Florida, p. 88.

> Regardless of varying objectives and curricula, there is a large body of instructional material which should be common to nearly all, if not all educational students. The portion of the instructional program is better adapted to standardized testing than the portion which varies more widely from school to school.[1]

While there can be little doubt that educational objectives include more than teaching subject matter, there also can be little doubt that the teaching of basic subject matter is an integral part of the educational aims of the public school. Therefore, student achievement in the fundamental subjects of English, social studies, natural sciences, and mathematics constitutes the third criterion of quality. Traditionally, school patrons are especially interested in the subject matter phase of the educational program. Therefore, this criterion might be termed the "school patrons' rating" of the quality of the educational program.

A yearly testing program was started in Florida over fifteen years ago and has since grown to state-wide proportions. In the Spring of 1950, tests were administered to a total of 16,665 seniors in 279 secondary schools. The American Council on Education Psychological Examination was given to measure mental ability; the Cooperative English, Effectiveness of Expression Examination, and the Cooperative General Achievement Tests were used to measure achievement in English, social studies, natural sciences, and mathematics. Of the 16,665 seniors taking the tests, 4,428 were enrolled in the forty-five schools used in this study. Only raw scores were used in order to eliminate grouping errors, and the majority of computations were done by International Business Machines to insure accuracy.

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[1] Cooperative Study of Secondary School Standards, *op. cit.*, p. 162.

In order to determine the relationship between mental ability and each of the four subject areas, Pearson r's were computed and the results were as follows: psychological and social studies, .77; psychological and English, .72; psychological and natural sciences, .72; psychological and mathematics, .68. It is immediately apparent that any measure of achievement based on proficiency in subject matter without taking mental ability into account would be a measure of mental ability of the students to a large degree, rather than a measure of the net achievement which one might assume to be caused by the educational program. The problem then was to devise a method for computing student achievement without penalizing schools with students of below average mental ability and rewarding schools with students of superior mental ability.

In order to solve the problem, it was necessary to get a measure of the extent to which the students of each school "achieved" in relation to students with the same mental capacities in other schools. For example, if school A had students of mean mental capacity (as measured by the psychological test) below the average of the 4,428 students, but achieved above the average in the four subject matter fields, it could be said that school A "achieved" in excess of its expected score. Thus, it would be possible to obtain one score for each school which would indicate the measure of excess (+), average (o), or deficit (-) achievement in all four subject areas.

The index of achievement used in this study can be thought of as the average difference between actual achievement and achievement predicted on the basis of the mental ability of the students. The averages were determined from scores made by the seniors of the forty-five schools on the English, social studies, natural sciences, and mathematics phases of the state-wide senior testing program. All differences were expressed in standard score units before averages were taken.

In the discussion below, subscripts 1, 2, 3, and 4 refer to English, social studies, natural sciences, and mathematics, respectively. Y refers to obtained raw scores; $\bar{Y}$ refers to predicted raw scores; Σ refers to the summation of indicated scores for all seniors taking the test in each individual school; σ_y refers to the standard deviation for all 4,428 student scores; X refers to the psychological scores (measure of mental ability); N refers to the number in each school taking the test; k refers to a constant in each case; Ia refers to index of achievement.

Equation (1) defines the index of achievement. The four terms within the brackets are measures of the average

$$I_a = \frac{1}{4}\left[\frac{\Sigma(Y_1-\overline{Y}_1)}{\sigma_{y_1}\cdot N}+\frac{\Sigma(Y_2-\overline{Y}_2)}{\sigma_{y_2}\cdot N}+\frac{\Sigma(Y_3-\overline{Y}_3)}{\sigma_{y_3}\cdot N}+\frac{\Sigma(Y_4-\overline{Y}_4)}{\sigma_{y_4}\cdot N}\right] \qquad (1)$$

difference between the obtained and predicted scores in English, social studies, natural sciences, and mathematics, respectively.

On the basis of 4,428 seniors taking the test, from the forty-five schools, correlation coefficients were computed between the psychological scores and scores in each of the subject matter areas. Using the four coefficients, four regression equations were computed for predicting scores in the four areas. Equation (2) is the regression equation used for predicting the scores in English. Similar

$$\overline{Y} = \left(\frac{\sigma_{y_1}}{\sigma_x}\ r_{xy_1}\right)X + k_1 \qquad (2)$$

equations were computed for Y_2, Y_3, and Y_4. Expression (3) indicates the average difference between the obtained and predicted scores in English, this difference being expressed in standard score units.

$$\frac{\Sigma Y_1 - \frac{\sigma_{y_1}}{\sigma_x}\, r_{xy_1}\,\Sigma X - Nk_1}{\sigma_{y_1} N} \qquad (3)$$

Equation (1) then takes the form of equation (4) with the substitution from the regression equation (2).

$$I_a = \left[\frac{\Sigma Y_1 - \frac{\sigma_{y_1}}{\sigma_x} r_{xy_1} \Sigma X - Nk_1}{4N\sigma_{y_1}} + \frac{\Sigma Y_2 - \frac{\sigma_{y_2}}{\sigma_x} r_{xy_2} \Sigma X - Nk_2}{4N\sigma_{y_2}} + \frac{\Sigma Y_3 - \frac{\sigma_{y_3}}{\sigma_x} r_{xy_3} \Sigma X - Nk_3}{4N\sigma_{y_3}} + \frac{\Sigma Y_4 - \frac{\sigma_{y_4}}{\sigma_x} r_{xy_4} \Sigma X - Nk_4}{4N\sigma_{y_4}} \right] \quad (4)$$

The specific regression equations of form (2) obtained from the coefficients of correlation shown on page 41 are as follows:

$$\begin{aligned} Y_1 &= .704\ x + 4.41 \\ Y_2 &= .888\ x - 20.61 \\ Y_3 &= .890\ x - 29.48 \\ Y_4 &= .753\ x - 28.77 \end{aligned} \quad (5)$$

Upon substitution of specific values from the regression equation (5), equation (4) becomes equation (6).

$$I_a = \frac{1}{N}\left[\frac{\Sigma Y_1 - .704\Sigma X}{44.0} + \frac{\Sigma Y_2 - .888\Sigma X}{51.7} + \frac{\Sigma Y_3 - .890\Sigma X}{55.1} + \frac{\Sigma Y_4 - .753\Sigma X}{49.5} \right] + 1.42 \quad (6)$$

For each of the forty-five schools, equation (6) was used to compute an index of achievement. The values of the indices varied from a -.26 to a + .33. In order to avoid the use of negative numbers, the measures of index of achievement were adjusted by the addition of 1.00 to each measure. This process will not affect the coefficients of correlation between the index of achievement and any of the factors used in this study. Table 5 shows the frequency of the adjusted indices of achievement for the forty-five schools.

TABLE 5

FREQUENCY OF INDEX OF ACHIEVEMENT RATINGS
FOR 45 SECONDARY SCHOOLS

Index of Achievement	Frequency
1.33	1
1.27	1
1.25	1
1.22	1
1.20	1
1.18	1
1.16	2
1.13	1
1.10	2
1.08	1
1.07	1
1.04	2
1.03	1
1.01	1
1.00	4
.99	2
.98	1
.96	3
.94	3
.93	3
.92	1
.91	1
.90	1
.89	2
.87	1
.86	1
.83	1
.80	3
.74	1
Average 1.00	

In order to test whether or not the index of achievement nullified undue influence of mental ability, the following method was used. A rank-difference correlation was computed between mental ability and the total raw scores made in four subject areas. The coefficient of correlation was .88. A rank-difference correlation between mental ability and the total adjusted scores in the four subject areas yielded a coefficient of correlation of .14. While, theoretically, it might be assumed that the latter correlation should be zero, the behavior of the correlation coefficient is some indication that the index of achievement gives a more valid basis of comparison than do raw scores for schools of unequal mental ability.

The importance of what the latter two quality criteria --Evaluative Criteria ratings and index of achievement--measure may be inferred, in part, from writings appearing in current periodicals. That schools must assume the comparatively new responsibility of teaching emotional adjustment, sense of responsibility, politeness, and similar factors is now being recognized. That schools still have the old responsibility of teaching subject matter is commonly accepted. Pertinent excerpts are quoted below:

> A series of far-reaching recommendations for the improvement of the Greenwich school system are contained in a voluminous report issued by the 200-man School Study Committee which has completed a two-year survey into the local system.
>
> The Greenwich school system, which for the second consecutive year, leads the state in per capita school expenditures, was hit by the study committee which deflated the illusion that Greenwich has the best school system in the state or in the East.
>
> The committee, divided into 11 subcommittees, hurled the brunt of its criticism at Greenwich High

> School from which, it said, students emerge below average in courtesy, consideration, responsibility and cooperativeness, according to employers and college heads interviewed.[1]

> By the standards of advance-guard pedagogy, Denver has a school system that is pretty up-to-date. It teaches everything from sociology to sewing, has "general education" classes that cover such items as driving, family living and health. Nonetheless, some Denver citizens have long been protesting that their well-adjusted children don't read and write well enough.
>
> Denver schoolmen decided to give 4,672 of the city's high-school students a battery of tests to find out whether the protesters knew what they were talking about. Last week the schoolmen admitted that, to a certain extent, the protesters did; in math problems the pupils scored three points below the national average, were little better in spelling; almost all were weak in grammar.[2]

The first of the immediately preceding quotations is an illustration of the fallacy of using school expenditures as the sole criterion of quality. The important question is not how much is spent on education, but rather, what does the money buy?

Summary

This chapter has attempted to justify the three criteria used to measure quality and has described the techniques employed in obtaining quality ratings.

It would appear that both the lay public and the educational profession generally agree that the quality of a school should be judged not only on the basis of the subject matter achievement of students but also on the basis of how well students attain courtesy, consideration, responsibility, and other elements of good citizenship. The index of achievement measures subject matter achievement of students making allowances for differences in mental ability. The Evaluative Criteria measures school practices which foster good citizenship. The third criterion of quality--holding power--measures the reaction, favorable or unfavorable, of the students who are experiencing the educational practices, the course offerings, the teachers' skills, the plant facilities, and all the other factors assumed to promote a better type of educational program.

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[1] _Port Chester Daily Item_, January 26, 1951.

[2] _Time_, February 5, 1951, p. 58.

CHAPTER III

SIX CONTROLLABLE FACTORS ASSUMED TO AFFECT SCHOOL QUALITY

Certain factors which can be controlled either administratively or financially are common to any educational program. The major purpose of this study is to analyze the relationship between certain controllable factors assumed to affect school quality and each of the three quality criteria described in Chapter II. Succeeding paragraphs will explain why the six factors were chosen and will describe the technique used in measuring the factors.

Factor Number One--Teachers' Salaries

The first factor is the average salary received by teachers in the secondary school. Principals' salaries are excluded.

From the very first attempts to analyze teachers' salaries down to the present time, the story has been one of struggle for adequate financial compensation. One of the first investigations of the salary question is described as follows:

> Prior to 1900 only a few attempts were made to analyze critically either the bases of rewarding teachers or the salary levels which could be appropriately established for them. Both Henry Barnard and Horace Mann wrote about teachers' salaries and emphasized the niggardliness of many school communities. Mann apparently employed the research technique in his efforts to improve the

> wretched conditions of teachers for, in the Common School Journal in 1843 (p. 355), he commented that he had inquired into the earnings of a number of craftsmen and found that teachers were the most poorly paid of any of the groups he studied.[1]

Further evidence of the emphasis placed on the issue of adequate salaries can be seen in the series of studies published by the Research Division of the National Education Association. The self-explanatory titles are as follows: Teachers' Salaries and the Public Welfare, Cost-of-Living Trends--Their Meaning for Teachers, The Cost of Living and Teachers Salaries, Salary Trends for Teachers and Other Groups.[2] The last of the foregoing studies was published in 1946. From Mann's investigation in 1843 to the present time, it seems that there never has been an occasion in public education when teachers' salaries were at a sufficiently high level to warrant a truly valid analysis of the effect of high salaries on the quality of education produced. For example, if an analysis were made of the relationship between quality of work and salary paid in industry, the salary would probably range from very low to very high, and thereby provide a better means for a more conclusive investigation. In the teaching profession, however, high salaries have never existed. In spite of this severe restriction, it would be unscientific just to assume that the teachers' salary range is too small to affect the quality of the educational program. Therefore, the average salary of teachers for each school was computed, as described in succeeding paragraphs, to determine the relationship between teachers' salaries and school quality.

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[1] W. S. Elsbree, J. E. Phay, "Salaries and Salary Schedules," Encyclopedia of Educational Research, Revised Edition, p. 1069.

[2] Ibid., p. 1071.

The salaries paid teachers were obtained from the principals' Report on School Organization and Personnel on file at the State Department. The salaries were totaled for each school and the sum was divided by the number of teachers in the school. Principals' salaries were not included. Table 6 shows the average salary paid in each school and the number of teachers in each school.

TABLE 6

NUMBER OF TEACHERS AND AVERAGE SALARY PAID TEACHERS (EXCLUDING PRINCIPALS) IN 45 SECONDARY SCHOOLS, 1949-1950

Number of Teachers	Average Salary
17	$3,580
97	3,557
39	3,519
19	3,496
28	3,393
12	3,346
72	3,332
81	3,296
71	3,295
21	3,282
73	3,215

TABLE 6 (continued)

NUMBER OF TEACHERS AND AVERAGE SALARY PAID TEACHERS (EXCLUDING PRINCIPALS) IN 45 SECONDARY SCHOOLS, 1949-1950

Number of Teachers	Average Salary
42	$3,211
15	3,200
20	3,194
42	3,180
29	3,178
11	3,165
16	3,163
20	3,132
75	3,130
19	3,105
38	3,061
39	3,057
60	3,055
28	3,052
14	3,015
59	3,008
14	2,997
14	2,985
17	2,927
25	2,919
13	2,913
21	2,907
26	2,898
21	2,860
25	2,851
13	2,840
14	2,815
12	2,787
14	2,779
15	2,769
14	2,735
17	2,709
13	2,695
8	2,592
Average	$3,071

Factor Number Two--Certification

The second factor is teacher certification which is indicative of the scope and character of the teacher's professional training. With the advent of the scientific method in education, increasing emphasis has been placed on discovering the difficulties teachers encounter and the weaknesses they display in the classroom, so that teacher training institutions can provide more valuable experiences in pre-service and in-service programs of study. In 1944, Hill made a summary of 475 research studies which analyzed the difficulties encountered by teachers. These studies were based on reports received from 12,372 teachers. The first ten difficulties, in order of frequency mentioned, were as follows:

1. Difficulties in providing for individual differences among pupils
2. Difficulties in teaching method
3. Difficulties of discipline, control, social development of the pupil
4. Difficulties of motivation, getting children interested, getting them to work
5. Difficulties in the direction of study
6. Difficulties in organizing and administering the classroom
7. Difficulties in selecting appropriate subject matter
8. Lack of time during the school day for all the things that need to be done
9. Difficulties in organization of materials
10. Difficulties in planning and making assignments[1]

In order to cope with the problems experienced by teachers, teacher training institutions have inaugurated courses specifically designed to overcome the weaknesses listed in the preceding quotation. A good example of the aims of teacher education is as follows:

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[1] G. E. Hill, "Teachers' Instructional Difficulties: A Review of Research," Journal of Educational Research, Vol. 37 (April, 1944), pp. 602-615.

> 1. To gain a thorough acquaintance with boys and girls of secondary school age; and to gain an understanding of the physiological, sociological, and psychological factors determining their development
> 2. To formulate a philosophy of education in relation to adolescents and the society of which they are a part
> 3. To discover the nature of the various agencies which carry on the work of education in modern society, the particular function of the school and its curriculum as a whole, and the place of the various subject fields in the total curriculum
> 4. To develop the art and science of teaching and to become familiar with and accustomed to the role of the teacher in the community and the administrative aspects of the school, as well as the classroom
> 5. To enter the profession of teaching with understanding of its status, ethics, organizations, major problems, and opportunities[1]

Further evidence of the attempt to meet teachers' needs by the teacher colleges can be seen in the various college bulletins of course offerings. A typical example of required courses includes the following:

> Aspects of Human Growth and Development.
> Human growth and development from birth and through adolescence. Knowledge of and characteristics of children and youth at each age or maturity level will be stressed. Laboratory periods are arranged for the observation of children and

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[1] H. W. Hartley, "Developing a Curriculum for Professional Teacher Preparation," A Functional Program of Teacher Education, pp. 76-77.

> youth in many situations found in the school and community. An effort will be made to understand the scientific principles which underlie the growth of human beings.[1]
>
> Principles and Practices of the Secondary School Program. Work will consist of readings, class discussions, observation and participation in school and community situations. Attention will be given to the scope, functions and type of secondary school curriculums; contributions and techniques of the specific teaching fields; and theories of learning and growth.[2]
>
> Theory and Practice in Teaching. This course integrates important aspects of educational psychology, philosophy, methods, and curriculum principles. Heavily weighted with direct contacts with children and experiences in the work of the teacher. Emphasis on observation and participation in laboratory school, selected off-campus teaching centers, children's community activities; special investigations, community surveys, directed reading, seminars.[3]

In view of the foregoing evidence, it is apparent that teacher training institutions are making a constant effort to train teachers who will be well qualified to do a good job. As teaching became more professionalized, greater dependence was placed on certification as a means of judging a teacher's qualifications. With regard to this, Anderson made the following statement:

> The effectiveness of the schools depends upon their adequate staffing by competent teachers. Such staffing is possible only if the supply

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[1] University of Florida, "Catalog 1950-51," *The University Record of the University of Florida*, LXV (May 1, 1950), p. 305.

[2] *Ibid.*

[3] *Ibid.*, p. 308.

> of qualified teachers in each category of teaching is sufficient to meet the need and if school authorities demand qualified teachers in filling school vacancies. "Qualified" usually means holding the regular state certificate for the type of teaching under consideration.[1]

The assumption that a certain amount of training required for certification will improve the quality of teaching is evidenced in the widespread use of legal provisions for certification requirements. Frazier's investigation showed the following:

> Every State in the Union, with the exception of Massachusetts, makes legal provisions for the certification of all or most of its public-school teachers. Massachusetts makes provisions for the State certification of certain special types of teachers or administrators only.[2]

There can be little doubt that a general assumption exists to the effect that if a teacher is properly certified, good quality teaching may be expected. This, then, is a factor that can be controlled by state legal provisions and by local requirements. A school may require a higher degree of certification or training than that which the state sets up as a minimum. This is especially true in Florida. The provisions for certification in Florida are as follows:

> Rank I. Those holding certificates based on one year or more of approved graduate work beyond the masters degree.

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[1] E. W. Anderson, "Teacher Personnel - V. Supply and Demand," Encyclopedia of Educational Research, Revised Edition, p. 1424.

[2] B. W. Frazier, Education of Teachers as a Function of State Departments of Education, p. 82.

> Rank II. Those holding certificates based on masters degree or one year of approved graduate work beyond the bachelors level or the equivalent of the bachelors level.
>
> Rank III. Those holding certificates based on an approved four year college degree or the equivalent.
>
> Rank IV. Those holding certificates based on 3 to 3.9 years of college training or the equivalent.
>
> Rank V. Those holding certificates based on 2 to 2.9 years of college training or the equivalent.
>
> Rank VI. Those holding certificates based on less than two years of college training or the equivalent.[1]

The Florida law further provides that "after July 1, 1951, the State Board shall discontinue allotments for instructional units in Rank VI."[2]

The problem of measuring the training of the teachers in the forty-five schools investigated was a comparatively simple one. Using the principals' *Report on School Organization and Personnel* on file at the State Department, a tally was made of the various certificate ranks in each school. The ranks for each school were then averaged so that one number represented the average rank. Table 7 shows the average certification ranks for the forty-five schools. A school having an average certification rank of 3 would indicate that the faculty members of that school had an average of four years training; an average of 2 would indicate an average of five years training. Thus, of the forty-five schools investigated only one school rated below a four year training average. The schools involved are not a select group with regard to amount of trained teachers. Florida teachers, as a whole, rank high in amount of professional preparation. Bailey, State Superintendent of Public Instruction, pointed out the following:

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[1] *Florida School Laws*, *op. cit.*, p. 29.

[2] *Ibid.*, p. 30.

> There can be no question about our teachers being well trained when we recall that only four years ago about 73% of our teachers held a four-year college degree or better and this year (1950-1951) we estimate that 91.5% of all teachers in Florida's public schools hold a four-year degree or better.[1]

TABLE 7

FREQUENCY OF AVERAGE CERTIFICATION RANKS IN 45 SECONDARY SCHOOLS, 1949-1950

Average Certification Rank	Frequency
2.2	1
2.3	1
2.4	1
2.5	2
2.6	4
2.7	15
2.8	13
2.9	7
3.0	0
3.1	1
Average 2.7	

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[1] T. D. Bailey et. al., 5 Views: The Story of Florida's Minimum Foundation Program, p. 2.

It can be readily seen that certification is a controllable factor. By basing teachers' salaries on the amount of preparation,[1] Florida experienced a marked upswing in better qualified teachers in a remarkably short time.

Factor Number Three--Scope

The third factor is the scope of the educational program. Scope is defined as the amount of subject offerings and special services provided in each school.

The fact that special services and a variety of course offerings are assumed to be directly related to the quality of education can be seen in the statements of recognized authorities with respect to the functions of a school. Morrison and Morphet said the following:

> 1. It is the function of the public school to provide educational opportunity for every child from the time he enters the school until he is ready to take his place in adult society.
>
> 2. An adequate educational opportunity includes:
>
>   a. Guidance in social living culminating in a social studies program that fits youth to take an effective part in adult society.
>
>   b. A health-and-physical-education program that provides periodical examination for all children, play facilities, and guidance in healthful living during the 24 hour day.
>
>   c. Mastery of the common integrating knowledges and skills needed by all persons who will live their normal lives outside of institutional care.
>
>   d. An adaption of the program to the needs of children who may be in any way socially, physically, or mentally handicapped.

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[1] Florida School Laws, op. cit., p. 30.

> e. A corresponding adaption of the program to the needs of those children who are specially talented, including emphasis upon scholarship commensurate with capacity for achievement.
>
> f. Development of appreciations, abilities, and expressions through the creative arts.
>
> g. Opportunity for growth through manual activity; practical arts for the younger children and industrial and household arts for the older children.
>
> h. For older children, prevocational studies leading to later specialization in skilled trades; and vocational preparation at the lower levels for those who must seek employment at the close of the secondary school period.
>
> i. Organization of curriculum materials around the ideas of child growth or development rather than through a group of more or less unrelated subjects.[1]

Investigations of school adequacy and educational opportunity have used course offerings and special services provided as determining factors. In comparing consolidated and non-consolidated schools, the Georgia State Department of Education[2] measured the amount of educational opportunity by using the number of courses each school offered above the required number as a basis. Pillsbury's[3] study also used course offerings and special services provided in determining the adequacy of Connecticut schools. Dawson pointed out that "the deficiencies of small high schools and the resultant inequalities of educational opportunities for the children affected are further exemplified by the limited curriculum offerings in small schools."[1] In regard to the effect of the scope on the holding power of a school, Varner said the following:

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[1] K. M. Cook (ed.), Reorganization of School Units, pp. 14-15.

[2] Georgia State Department of Education, Look at Our Schools: 1949, p. 9.

[3] W. H. Pillsbury, Study of Administration and Supervision in Connecticut, pp. I-9.

> . . . we must have a curriculum revision which will take care of people of low ability--those who are emotionally maladjusted and, also, those who do not fit into our regular curriculum. We must build up courses--lots of courses--for those people.[2]

In the investigation made by the National Commission on School District Reorganization, the Commission concluded that the new educational needs arising from changes in social and economic life should be met by "enrichment and expansion of the curriculum."[3] In view of the preceding evidence, there can be no doubt that the assumption exists that the quality of a school is closely related to the scope of its educational program.

In order to secure a quantitative measure of the scope of the schools investigated, the technique developed by Woodham[1] was used. By assigning relative weights to certain phases of special services and to the variety of course offerings, Woodham arrived at a single figure which indicated the total number of educational opportunity units in each school. Since the forty-five schools used in this study, however, are not homogeneous in organization, it was necessary to divide the total number of educational opportunity units of each school by the number of grades in the school to achieve a figure that would indicate the average scope of the educational program, unaffected by the number of grades in school. Table 8 shows the type of organization of the forty-five schools investigated and the average number of educational opportunity units in each.

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[1] H. A. Dawson, Satisfactory Local School Units, p. 90.

[2] United States Office of Education, Why Do Boys and Girls Drop Out of School, and What Can We Do About It? p. 28.

[3] H. A. Dawson et. al., Your School District, p. 126.

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[1] W. J. Woodham, "The Relationship Between the Size of Secondary Schools, the Per Pupil Cost, and the Breadth of Educational Opportunity," Unpublished Doctoral Dissertation, University of Florida, 1950, pp. 57-61.

TABLE 8

THE ORGANIZATIONAL PLAN AND THE AVERAGE NUMBER OF EDUCATIONAL OPPORTUNITY UNITS PER YEAR IN 45 SECONDARY SCHOOLS

Total Opportunity Units in Secondary Schools	Number of Years in Secondary Schools	Average Educational Opportunity Units Per Year
71.0	3	23.7
68.0	3	22.7
63.0	3	21.0
61.0	3	20.3
83.0	5	16.6
49.5	3	16.5
84.0	6	14.0
53.0	4	13.3
50.0	4	12.5
49.0	4	12.3
72.5	6	12.1
58.5	5	11.7
69.5	6	11.6
69.0	6	11.5
66.5	6	11.1
66.5	6	11.1
44.5	4	11.1
66.5	6	11.1
66.0	6	11.0
66.0	6	11.0
60.0	6	10.0
59.0	6	9.8
37.0	4	9.3
56.0	6	9.3
55.0	6	9.2
53.5	6	8.9
53.5	6	8.9
53.0	6	8.8
51.5	6	8.6
51.0	6	8.5
50.0	6	8.3
50.0	6	8.3
49.0	6	8.2
48.0	6	8.0
47.5	6	7.9
46.5	6	7.8

TABLE 8 (continued)

THE ORGANIZATIONAL PLAN AND THE AVERAGE NUMBER OF EDUCATIONAL OPPORTUNITY UNITS PER YEAR IN 45 SECONDARY SCHOOLS

Total Opportunity Units in Secondary Schools	Number of Years in Secondary Schools	Average Educational Opportunity Units Per Year
46.5	6	7.8
45.5	6	7.6
45.5	6	7.6
45.0	6	7.5
45.0	6	7.5
43.0	6	7.2
43.0	6	7.2
40.0	6	6.7
39.0	6	6.5

Factor Number Four--Size

The fourth factor is the size of the school. Size is defined as the student membership in a school.

Numerous investigators have analyzed the relationship between the size of the school and the cost of the educational program. In addition to concluding that large schools cost less per pupil than small schools, many studies have indicated that the quality of the educational program can be improved by increasing the size of the school. In an investigation of local school units Dawson said the following:

> . . . in other words, the most important thing that can be done to improve the quality of the

> educational offering in small high schools is to make the schools larger.[1]

By quality Dawson evidently referred to the amount of course offerings and special services provided by the school. In fact, much of the argument, other than for reasons of economy, for school size is based upon the fact that more special services and a wider variety of course offerings are obtainable in larger schools. This method of judging the efficiency or quality of schools is very similar to the "statistical analyses of objective factors" technique used in earlier studies, as described in Chapter I of this investigation. Studies by Dawson, Pillsbury, and the Georgia State Department of Education, mentioned in the preceding section on Scope, clearly demonstrate the assumption that school quality or efficiency is closely related to the breadth of the educational program and the special services provided. Seyfert's study of the relationship between school size and school efficiency summarized the relationship as follows:

> . . . it appears that with but very few exceptions large reorganized schools, both junior and senior, are superior in organization to small schools. This superiority can be seen both in the comparative number of procedures used by large schools and small and in the specific practices undertaken in these schools. It will be granted that this estimate of superiority has been obtained through an examination of administrative

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[1] Dawson, Satisfactory Local School Units, p. 90.

> organization rather than through a study of results produced. Moreover, it must be conceded that in some measure the superiority of the large school appears to be greater than it actually is, since the small school often does not need so extensive an organization to secure a desired end as does a large school.[1]

Seyfert epitomized quite well, in the quotation cited above, the weakest link in the technique so prevalently used in measuring the efficiency or quality of schools. The fact that larger schools cost less per pupil to operate than do smaller schools cannot be argued. Studies by Holmstedt,[2] Nannings,[3] Illinois Legislative Council,[4] Florida Citizens Committee,[5] Washington State Planning Council,[6] and many others prove the economic desirability of large schools over small schools. The crux of the matter, insofar as this investigation is concerned, however, is to determine what relationship exists between the size of the school and the results produced as measured by the three criteria described in Chapter II of this study.

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[1] W. C. Seyfert, School Size and School Efficiency, p. 268.

[2] R. W. Holmstedt, "Factors Affecting the Organization of School Attendance Units," Bulletin of the School of Education, Indiana University, X, No. 3 (June, 1934).

[3] S. P. Nannings, "Cost and Offerings of California High Schools in Relation to Size," Journal of Educational Research, XXIV (December, 1931) pp. 363-364.

[4] Illinois Legislative Council, School Administration in Illinois, p. 17.

[5] Florida Citizens Committee, op. cit., p. 69.

[6] Washington State Planning Council, A Survey of the Common Schools in Washington, p. 87.

In the forty-five schools there is a definite relationship, as evidenced by a Pearson zero-order correlation of .79, between the size of the school and the breadth of the educational program. Table 9 shows the size and scope of the forty-five schools investigated. An analysis of the relationship between size and the three quality criteria will be made in Chapter IV.

TABLE 9

THE SIZE (MEMBERSHIP) AND THE AVERAGE NUMBER
OF EDUCATIONAL OPPORTUNITY UNITS PER
YEAR OF 45 SECONDARY SCHOOLS

Size (Membership)	Average Educational Opportunity Units Per Year
1,031	23.7
2,155	22.7
1,675	21.0
1,623	20.3
2,358	16.6
797	16.5
1,416	14.0
721	13.3
486	12.5
514	12.3
1,647	12.1
909	11.7
1,641	11.6
799	11.5
700	11.1
564	11.1
472	11.1
453	11.1
754	11.0
1,087	11.0

TABLE 9 (continued)

THE SIZE (MEMBERSHIP) AND THE AVERAGE NUMBER OF EDUCATIONAL OPPORTUNITY UNITS PER YEAR OF 45 SECONDARY SCHOOLS

Size (Membership)	Average Educational Opportunity Units Per Year
583	10.0
551	9.8
258	9.3
286	9.3
497	9.2
365	8.9
205	8.9
331	8.8
204	8.6
281	8.5
146	8.3
315	8.3
199	8.2
448	8.0
246	7.9
253	7.8
249	7.8
192	7.6
156	7.6
364	7.5
337	7.5
262	7.2
258	7.2
278	6.7
126	6.5

Factor Number Five--Administration

The fifth factor is administration. Administration as used in this study can best be defined by the following quotation which precedes the section of the Evaluative Criteria devoted to rating "School Administration":

Education is one of the largest business enterprises in every community and directly influences the daily lives of the great majority of the inhabitants. The head or superintendent of an enterprise so extensive, complex, and influential should have marked administrative ability and should be especially prepared for the task. The board of control should delegate administrative functions and authority to an individual qualified for the work. The board should retain the determination of general policies and some judicial functions.

The administrative head is then the chief executive officer of the board of control. He should be responsible for the selection and assignment of all school employees (the board confirming his selection), for the business management of the school, including school plant and equipment, and for the administration of the educational program, including supervision of instruction. This should require organization of resources, both material and personal; delegation of duties and authority; and supervision of all delegated tasks and of all individuals to whom authority and responsibility are assigned. The better the administrative personnel, the more efficient will be the organization and management and the greater the probability of the successful attainment of the school's objectives, provided the personnel is always mindful of the primary function of the school--the development of its pupils. Success should be measured in terms of results, not of machinery.

The activity most neglected by administrators is supervision, particularly supervision of instruction. This involves not only the organization of programs of studies and of instructional activities but also revision of curricula, pupil activities, non-instructional school activities of staff members, and every other phase of the educational program. Alert and sympathetic supervision makes management and organization effective. Whatever is educationally desirable and attainable should be made available and effective through able administration.

> The administrative head of the school should share with the controlling board responsibility for establishing and maintaining desirable relations with the school's public. Communities too little appreciate that the school is their greatest cooperative enterprise and that it permanently affects the welfare of their children. This requires that the supporting public be informed regarding the policies, program, objectives, activities, and plans for the future of the school and that the support of the public be assured for the school's undertakings. There should always be a sympathetic and understanding relationship between the school and its administration on the one hand and its public on the other--whether this public be closely concentrated as is usually the case with public schools, or more widely distributed as is often the case with private schools.[1]

The foregoing quotation is the "Statement of Guiding Principles" an evaluator is supposed to read before rating the administration phase of the Evaluative Criteria. There can be little doubt that the quality of a school may well hinge on the success with which the administrative duties described above are carried out. In commenting on the coverage of administrative duties by the Evaluative Criteria, Koos said the following:

> In common parlance the term administration is taken to comprehend the management of all aspects of inquiries like the National Survey of Secondary Education or the Cooperative Study of Secondary School Standards. . . .

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[1] Cooperative Study of Secondary Standards, op. cit., p. 131.

> The best theory seems to follow this broad concept.[1]

With respect to the difference between supervision and administration, in the broad phase of administration, Koos commented as follows:

> . . . supervision has to do directly with the educative process. Administration, on the other hand, because it includes activities in organization and management of the school, has to do less directly with the educative process.
>
> It is no disparagement of administration (in the more restricted sense) in comparison with supervision that it thus bears less directly on the educative process itself. To provide by means of organization and management, the conditions under or the facilities with which the educative process may go forward effectively is a function no less important than supervision.[2]

In analyzing the various phases of administration, Edmonson emphasized the principal's obligation to improve instruction. His statement follows:

> One of the major obligations of a real principal is to improve the quality of instruction through constructive leadership. He also has an unusual opportunity to influence and guide the students in matters of health, character, and mental development.[3]

The importance of the superintendent of schools to the efficiency of the school system is pointed out by Reeder in the following quotation:

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[1] L. V. Koos et. al., Administering the Secondary School, pp. 4-5.

[2] Ibid., p. 5.

[3] J. B. Edmonson, The Administration of the Modern Secondary School, p. 80.

> The superintendent of schools is the most important educational officer, perhaps any public officer, in a community. He determines, more than any other person, the efficiency of the school system. If he is well qualified for his position, he will often be able to cause an efficient school system to emerge in spite of many handicaps; he will bring about this result by his ability to educate the board of education, school employees, and the public to his point of view. On the other hand, if he is not qualified, there is danger that the school system will mark time or even deteriorate.[1]

With regard to the school district board of education, Reeder said the following:

> What the citizens of the next generation will be, the schools of today will largely determine, and what the schools are, boards of education chiefly determine; ergo, the importance of the position of school board members.[2]

Although various writers divide the broad field of administration into segments for analysis, all agree that each part is related to the quality of the school program. Cooke summarizes all the aspects of administration and their relation to the school program in the following quotation:

> All of school administration, the construction and operation of the buildings, the management of business affairs, the organization and direction of educational affairs, and the development of public support through an understanding of the purposes of

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[1] W. G. Reeder, The Fundamentals of Public School Administration, p. 72.

[2] Ibid., p. 77.

> the school contribute to the one purpose namely, the proper development of the pupil.[1]

Thus it is evident that all phases of the administrative "team" are assumed to be related to the quality of the school, and the only way to analyze such a relationship is to use "administration" in its broadest sense. The following outline indicates the comprehensiveness of Section L, of the Evaluative Criteria, which was used to obtain a rating for the administration factor:

I Administrative Staff
  A Numerical Adequacy
  B Preparation and Qualifications
  C Improvement in Service

II Organization
  A The Board of Control
  B General Policies
  C The Superintendent of Schools
  D The Principal

III Supervision of Instruction
  A Objectives
  B Procedures and Activities
  C Principles of Supervision
  D Results of Supervision

IV Supervision of Special Services
  A Cafeterias, Dining Rooms, and Kitchens
  B Transportation Pupils

V Business Management
  A General Duties and Procedures
  B The Budget
  C Accounting
  D Maintenance and Operation

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[1] D. H. Cooke et. al., Principles of School Administration, p. 235.

VI School and Community Relations
  A Information for Parents and Community
  B Community Services
  C Procedures

VII Special Characteristics of the School Administration

VIII General Evaluation of the School Administration[1]

The procedure followed in gathering the data was the same as that described in Chapter II for securing the rating of the educational program. The committee ratings given for each sub-section on administration were averaged for the final figure which represented the administration score made by each school. Table 10 indicates the frequency of the average ratings.

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[1] Cooperative Study of Secondary School Standards, op. cit., Section L, "School Administration."

TABLE 10

FREQUENCY OF AVERAGE RATINGS IN "SCHOOL ADMINISTRATION" FOR 45 SECONDARY SCHOOLS

Average Rating	Frequency
4.3	2
4.2	0
4.1	2
4.0	5
3.9	5
3.8	1
3.7	4
3.6	8
3.5	3
3.4	5
3.3	2
3.2	3
3.1	0
3.0	3
2.9	2
Average 3.6	

Factor Number Six--Plant

The sixth factor is plant. Plant is defined herein as including the site, building, and equipment.

Educational literature is replete with references to the importance of plant facilities to the school program. Research in educational psychology indicates that there is a definite relationship between the school environment and the efficiency of the students. Crow and Crow pointed out that feelings of fatigue are experienced by students if study conditions are unfavorable because of "inadequate lighting, extremes of temperature or humidity,"[1] and other factors. In addition, an unfavorable site, such as one alongside a main highway or busy street, "gives rise to so many distracting influences that extra effort is required if the learner is to concentrate his attention upon study content."[2] Pressey and Robinson commented on the importance of having suitable plant facilities as follows:

> Emphasis has been put upon the importance of adequate lighting and satisfactory seating if schoolwork is to go forward satisfactorily. But other conditions are also important. The fact that 42 per cent of American school buildings were erected before 1900--long before the

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[1] L. D. Crow and A. Crow, Educational Psychology, pp. 265-266.

[2] Ibid., p. 266.

> science of lighting, noise control, and functional arrangement--would indicate that many poor conditions exist.[1]

Experts in school administration as well as psychologists emphasize the importance of having an adequate site, good building, and sufficient equipment so that the maximum learning can take place, as the following excerpts indicate:

> An educational program is conditioned by many factors, and one of the most influential is the building in which the school functions.[2]
>
> The utilization of the building and grounds in the execution of the educational program is probably the administrator's most important problem.[3]
>
> The possibilities for success of a program do not depend entirely on the efficiency of the faculty. The building itself must furnish facilities for study and for physical and social development.[4]
>
> . . . in most cities the principal is recognized as the responsible head of the school with authority to direct and to supervise the work of the custodians to the end that the educational program may not suffer because of unsatisfactory care of building and grounds.[5]

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[1] S. L. Pressey and F. P. Robinson, Psychology and the New Education, p. 514.

[2] Maxwell and Kilzer, High School Administration, p. 425.

[3] L. V. Koos et. al., op. cit., p. 495.

[4] J. B. Edmonson et. al., op. cit., p. 109.

[5] P. B. Jacobson and W. C. Reaves, Duties of School Principals, p. 695.

Realization of the value of adequate plant facilities has grown to such an extent that forty-five state departments have issued plant standards for the accrediting of high school. Also, some states have enacted laws relating to school building construction.[1] Chase summarized the expert opinion, with regard to plant facilities, when he said the following:

> School buildings, equipment, transportation, and supplies are not ends in themselves, but they are important means toward provision of needed educational programs and services. Inadequate buildings, equipment, transportation, or supplies lessen the chances for satisfactory educational programs and may endanger the welfare of children.[2]

The following outline indicates the items included in Section K, "School Plant," which was used to obtain a rating for each of the forty-five schools:

- I The Site
  - A Health and Safety
  - B Economy and Efficiency
  - C Influence on the Educational Program

- II The Building
  - A Health and Safety
  - B Economy and Efficiency
  - C Influence on the Educational Program

- III Equipment
  - A Health and Safety
  - B Economy and Efficiency
  - C Influence on the Educational Program

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[1] D. H. Cooke et. al., op. cit., p. 165.

[2] F. S. Chase (Director) and E. L. Morphet (Associate Director), The Forty-Eight State School System, p. 88.

- IV Special Services
    - A Cafeterias, Dining Rooms, and Kitchens
    - B Clinics, Infirmary or Hospitalization
    - C Sleeping and Study Quarters
- V Special Characteristics of the School Plant
- VI General Evaluation of the School Plant

The method used to obtain a quantitative rating for "Plant" was the same as that used to secure a rating for "Administration." Table 11 indicates the frequency ratings for each of the forty-five schools.

TABLE 11

FREQUENCY OF AVERAGE RATINGS FOR "SCHOOL PLANT" IN 45 SECONDARY SCHOOLS

Average Rating	Frequency
4.4	1
4.3	0
4.2	0
4.1	0
4.0	3
3.9	1
3.8	2
3.7	1
3.6	1
3.5	4
3.4	5
3.3	7
3.2	1
3.1	5
3.0	2
2.9	1
2.8	4
2.7	3

TABLE 11 (continued)

FREQUENCY OF AVERAGE RATINGS FOR "SCHOOL PLANT" IN 45 SECONDARY SCHOOLS

Average Rating	Frequency
2.6	1
2.5	2
2.4	0
2.3	0
2.2	1
Average 3.2	

Summary

The purpose of this chapter has been (1) to present evidence that certain factors are assumed to affect the quality of the school program and (2) to discuss the techniques employed in gathering the necessary information and in obtaining a quantitative measure of each of the six factors. Expert opinion, prevalent usage in schools, enactment into law, and programs of training--all these constitute the evidence that average salary, certification, scope of program, school size, administration, and plant facilities are assumed to influence the quality of the schools.

CHAPTER IV

THE RELATIONSHIPS BETWEEN SIX CONTROLLABLE FACTORS AND THREE SELECTED MEASURES OF QUALITY

The purpose of this chapter is to answer the question, "What is the extent of the relationships existing between six controllable factors assumed to affect school quality and three selected measures of quality?" In addition, the relationships of the three measures of quality to each other will be analyzed. Relationships will be indicated by coefficients of correlation. Zero-order coefficients were computed by the Pearson product-moment method[1] unless indicated otherwise. The Doolittle method[2] was used to compute partial correlations from the Pearson zero-order correlations. Multiple correlations[3] were computed between all six factors and each measure of quality. Levels of confidence were computed by Fisher's z- function.[4] Before presenting the coefficients of correlation, it might be well to discuss some of the guiding principles with regard to the interpretation of correlation coefficients.

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[1] H. E. Garrett, Statistics in Psychology and Education, pp. 282-289.

[2] C. C. Peters and W. R. Van Voorhis, Statistical Procedures and Their Mathematical Bases, p. 227.

[3] *Ibid.*, p. 240.

[4] F. L. Goodenough, Mental Testing, p. 267.

Garrett described the two broad reasons for obtaining correlations as follows:

> In the first place, r's are computed in order to determine whether there is _any_ correlation (over and above chance) between two variables; and in the second place, r's are computed to determine the degree or closeness of relationship when some association is known, or is assumed, to exist.[1]

In order to interpret the degree or closeness of relationship of a correlation, however, an analysis of the variables used is necessary. For example, although Garrett listed correlations of .00 to ±.20 as negligible, ±.20 to ±.40 as slight, ±.40 to ±.70 as substantial, and ±.70 to ±1.00 as high to very high, he cautioned "this classification is broad and somewhat tentative, and can only be accepted as a general guide with certain reservations."[2] The five main reservations listed by Garrett are as follows:

(1) the nature of variables with which we are dealing
(2) the significance of the coefficient
(3) the size and variability of the group
(4) the reliability of the tests used
(5) the purpose for which the r was computed[3]

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[1] Garrett, _op. cit._, pp. 332-333.

[2] _Ibid._

[3] _Ibid._, p. 333.

In discussing the matter of the variables Garrett pointed out the following:

> . . . an r of .30 between height and intelligence, or between head measurements and mechanical ability would be regarded as important although it is low, since correlations between physical and mental functions are usually much lower--often zero. On the other hand, the correlation must be .70 or more between measures of general intelligence and school grades or between achievement in English and in history to be considered high since r's in this field usually run from .40 to .60.[1]

Goodenough, in discussing the significance of correlations at the 20 per cent, 10 per cent, 5 per cent, 2 per cent, and 1 per cent level of confidence, said the following:

> The selection of these particular points for inclusion in the published tables was, of course, based merely upon arithmetical convenience. But to many who use the tables, these points seem to have taken on a kind of sacrosanct character in comparison to which the levels falling beyond and between them are of slight consequence. This has too often led to the reporting of statistical results merely as "significant" or "not significant" in place of giving the actual figures for what they may be worth.[2]

Peters and Van Voorhis pointed out the fallacy of setting up strict levels of confidence by which either to accept or to reject correlations in the following quotation:

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[1] *Ibid.*, p. 334.

[2] Goodenough, *op. cit.*, p. 233.

> If the F falls below the 5 per cent point, this means that there are more than 5 chances in 100 that accidents of fluctuation might account for one's finding and that he must not be at all sure of any real differences among his classes. But, conversely, it means that there are, maybe, 85 or 90 chances in 100 (8 or 10 to 1) that there *are* real differences which a better controlled study would reveal. . . . It is an error of one form to overreadily accept the conclusiveness of our findings; but it is an error of a second form to suppose that a hypothesis has been fully refuted when it has merely been brought below the level of certainty.[1]

The variables used in this study are not expected to yield numerically high coefficients of correlation. It has been emphasized that the factors used are assumed to affect quality. The evidence presented in Chapter III indicates the prevalency of such an assumption.

The significance of each correlation is shown statistically without any rigid level of confidence restrictions. The significance is expressed in terms of the probability that contradictory results in correlation trends (from plus to minus or from minus to plus), but not necessarily in magnitude, could be expected if further investigations were made under similar conditions. It should be noted that this procedure of representing the significance of an obtained coefficient of correlation is different from the way in which levels of confidence are usually interpreted. The interpretation in this study deals with a one-tailed test of significance[1] rather than a two-tailed test of significance since the primary interest is in deviations of the correlation coefficients in only one direction, namely, a contradiction in sign. The probabilities of contradictory results are expressed in per cents in the tables that follow and will be referred to as PCR (probability of contradictory results) hereafter. Since no studies similar to this one have been found, there is no "pattern" with which obtained coefficients can be compared so as to designate coefficients as being "high" or "low."

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[1] Peters and Van Voorhis, *op. cit.*, p. 359.

On succeeding pages it is to be understood that all PCR figures are based on the correlations obtained from a sample of forty-five. Correlations derived from smaller or larger samples would produce different PCR values.

The purpose for which the r's are computed is to determine "points of emphasis" for improving the quality of education, as measured by the three criteria in the schools investigated. In other words, an analysis of the six controllable factors will indicate which ones hold the most consistent positive relationships with each of the quality measures.

The intercorrelations of the six controllable factors are shown in Table 12. It is apparent that the relationship of certain factors to each other might influence the zero-order correlation of each factor to each of the three criteria. In order to derive the net

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[1] A. L. Edwards, Experimental Design in Psychological Research, p. 124.

TABLE 12

INTERCORRELATIONS OF THE SIX CONTROLLABLE FACTORS

	X_1	X_2	X_3	X_4	X_5	X_6
X_1	1.00	.50	.44	.15	.25	.21
X_2		1.00	.79	.25	.05	.22
X_3			1.00	.17	.05	.21
X_4				1.00	.41	.08
X_5					1.00	-.21
X_6						1.00

X_1 = Average Salary
X_2 = Size
X_3 = Scope
X_4 = Plant
X_5 = Administration
X_6 = Average Certification Rank

relationship of each of the factors to each of the criteria, partial coefficients were computed. Goodenough defines partial correlation as follows:

> The degree of relationship between two variables that remains after the effect of one or more other variables, common to both,

> has been removed by reducing the variance of these factors to zero, thus assigning them a constant value for all cases.[1]

Succeeding paragraphs will indicate the relationship between each of the six controllable factors and each of the three measures of quality. Relationships will be shown by zero-order coefficients, partial coefficients, and multiple coefficients.

Holding Power

The zero-order coefficients of correlation between each of the controllable factors and holding power are shown in Table 13. The PCR for each coefficient is also shown. The relationship between average certification rank and holding power is .27. The PCR for a correlation of .27 is 4 per cent. In other words, 4 times out of one hundred, a negative correlation might be found in further investigations under similar conditions. Although plant has the second highest positive correlation of the six factors, the coefficient of .12 is low with a PCR of 22 per cent. It is therefore considered that the relationship between plant and holding power is negligible. The correlation of .05 between size and holding power and -.01 between scope and holding power are considered negligible. Administration and average salary show negligible relationships to holding power of -.10 and -.14, respectively.

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[1] Goodenough, op. cit., p. 547.

TABLE 13

ZERO-ORDER COEFFICIENTS OF CORRELATION FOR HOLDING POWER AND SIX CONTROLLABLE FACTORS

Holding Power; Correlation with	Zero-Order Coefficient	Probability of Contradictory Results (PCR)
Average Certification Rank	.27	.04
Plant	.12	.22
Size	.05	.37
Scope	-.01	.47
Administration	-.10	.26
Average Salary	-.14	.18

Table 14 indicates the partial coefficients of correlation obtained between each of the six factors and holding power. Average certification rank still holds the first place, among the six factors, with a correlation of .28 which has a PCR of 3 per cent. Correlations of .03 and -.08 for administration and scope, respectively, are low and considered negligible. Average salary indicates a possible negative relationship with holding power as shown by a correlation of -.21.

TABLE 14

PARTIAL CORRELATIONS OF HOLDING POWER AND SIX CONTROLLABLE FACTORS

Holding Power; Correlation with	Partial Coefficient	Probability of Contradictory Results (PCR)
Average Certification Rank	.28	.03
Plant	.11	.24
Size	.11	.24
Administration	.03	.43
Scope	-.08	.30
Average Salary	-.21	.09

The multiple coefficient of correlation between all six factors and holding power is .38. The PCR for a coefficient of .38 is 1 per cent.

Analysis

Teacher certification has the highest degree of relationship with holding power. Plant, size, administration, and scope show negligible relationships with holding power. Salary shows a slight negative correlation with holding power. It is emphasized, however, that the relationship of teachers' salaries to any criterion of quality is questionable since the salary range appears to be below the "effectiveness" level. For example, if a correlation were computed between the general health of a group of men adrift for days in a lifeboat and the amount of fresh water each drank daily, there would be little hope for a valid correlation if the daily water ration ranged from one hundred to two hundred drops per person. In addition, the salary range of from $2,592 to $3,580 might well be nullified by income tax and variance of cost of living. In other words, the average net salary range is probably very small.

The negligible relationships of the other factors do not necessarily mean that they have no relationship with holding power, but rather that they may have already fulfilled their purposes. The latter possibility might be illustrated more clearly by using the "lifeboat" analogy previously mentioned. If the daily water ration ranged from one gallon to ten gallons per person, no valid correlation could be expected between health status and amount of water consumed. In other words, a temporary plateau may have been reached insofar as the effectiveness of the factors is concerned.

Evaluative Criteria

The zero-order correlations between each of the six controllable factors and the quality of the educational program as rated by the Evaluative Criteria are shown in Table 15. The correlation coefficients of .47

TABLE 15

ZERO-ORDER COEFFICIENTS OF CORRELATION FOR THE EVALUATIVE CRITERIA AND SIX CONTROLLABLE FACTORS

Evaluative Criteria; Correlation with	Zero-Order Coefficient	Probability of Contradictory Results (PCR)
Plant	.47	.01
Administration	.37	.01
Size	.22	.08
Scope	.21	.09
Average Salary	.06	.35
Average Certification Rank	-.01	.47

and .37 for plant and administration, respectively, have a PCR of 1 per cent each. The correlation coefficient of .22 for size has a PCR of 8 per cent, and the correlation of .21 for scope has a PCR of 9 per cent. Correlation coefficients for average salary and average certification rank are considered negligible.

Table 16 shows the partial coefficients of correlation between each of the six factors and the Evaluative Criteria. Even after the influence of the other factors has been removed, plant still holds a fairly high coefficient of correlation. The correlation of .33 for plant has a PCR of 2 per cent, and the correlation of .25 for administration has a PCR of 6 per cent. The correlations of .08 for size, .08 for scope, and .01 for average certification rank are considered negligible. A correlation of -.16 for average salary is not considered very significant.

TABLE 16

PARTIAL CORRELATIONS OF EVALUATIVE CRITERIA AND SIX CONTROLLABLE FACTORS

Evaluative Criteria; Correlation with	Partial Coefficient	Probability of Contradictory Results (PCR)
Plant	.33	.02
Administration	.25	.06
Size	.08	.30
Scope	.08	.30
Average Certification Rank	.01	.47
Average Salary	-.16	.15

The multiple coefficient of correlation between all six factors and the Evaluative Criteria ratings is .54. The PCR for a coefficient of .54 is 1 per cent.

Analysis

Plant and administration hold a fairly high degree of relationship with the Evaluative Criteria ratings. Zero-order coefficients for size and scope show a fairly high positive relationship with the Evaluative Criteria but do not evidence any significant relationship with Evaluative Criteria ratings when other factors are held constant. The coefficients of correlation between average salary and the Evaluative Criteria ratings indicate a negligible relationship.

Index of Achievement

The zero-order coefficients of correlation between each of the six controllable factors and the index of achievement are shown in Table 17. The correlation of .21 between plant and the index of achievement has a PCR of 8 per cent. A correlation of .10 between administration and the index of achievement is considered negligible. Correlations of .03 and .02 between scope and the index of achievement and size and the index of achievement, respectively, are considered negligible. Average salary and average certification rank yield negligible correlations of -.08 and -.09, respectively, with the index of achievement.

TABLE 17

ZERO-ORDER COEFFICIENTS OF CORRELATION FOR THE INDEX OF ACHIEVEMENT AND SIX CONTROLLABLE FACTORS

Index of Achievement; Correlation with	Zero-Order Coefficient	Probability of Contradictory Results (PCR)
Plant	.21	.08
Administration	.10	.26
Scope	.03	.42
Size	.02	.45
Average Salary	-.08	.30
Average Certification Rank	-.09	.28

Table 18 shows the partial correlations between each of the six factors and the index of achievement. Plant still holds the highest degree of positive relationship with the index of achievement. The partial correlation of .19, however, lowers the PCR to 12 per cent. Partial r's of .05, .02, and .01 for scope, administration, and size, respectively, are considered negligible. Average certification rank and average salary yield negligible coefficients of -.09 and -.11, respectively.

TABLE 18

PARTIAL CORRELATIONS OF INDEX OF ACHIEVEMENT AND SIX CONTROLLABLE FACTORS

Index of Achievement; Correlation with	Partial Coefficient	Probability of Contradictory Results (PCR)
Plant	.19	.12
Scope	.05	.37
Administration	.02	.45
Size	.01	.47
Average Certification Rank	-.09	.28
Average Salary	-.11	.24

The multiple coefficient of correlation between all six factors and the index of achievement is .26. The PCR for a correlation of .26 is 5 per cent.

Analysis

Plant appears to be the only factor that has any degree of positive relationship with the index of achievement. Factors of scope, administration, and size indicate negligible relationships with the index of achievement. Average certification rank and average salary show negligible relationships with the index of achievement.

Student Achievement Without Making Allowances for Differences in Mental Ability

Two important questions with regard to mental ability are as follows: (1) Is mental ability constant or can it be increased with effort? (2) Do intelligence tests measure mental ability, or the extent of one's own experiences, or reading ability? Goodenough summarized the quandary in the following quotation:

> The question of the extent to which intelligence can be improved by training is one of the most vexing that has appeared in the entire field of mental testing. Dozens of studies have been made, utilizing various methods of approach. Each of the methods has its own possibilities of error and its own limitations in demonstrating the facts and drawing conclusions from them. Perhaps it is not surprising, therefore, to find that although a quarter of a century has elapsed since the first of the major investigations was begun, the issue is still joined. No final answer can be given to the matter at present . . .[1]

The index of achievement measured how well a student "achieved" in proportion to his mental ability. To complete the picture, zero-order correlations were computed between each of the six controllable factors and student achievement on standardized tests without making allowances for differences in mental ability. Table 19 shows the correlations obtained. In computing the relationship between scope and achievement, there appeared to be a negligible relationship even though preliminary investigations by the rank-difference method indicated a fairly high positive relationship. A scattergram of the two factors was made, and it was discovered that curvilinearity caused the wide divergence. It was therefore decided to compute the rank-difference correlations, as well as the Pearson r correlations, for all factors. Both types of correlations are included in Table 19.

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[1] Goodenough, _op. cit._, p. 536.

TABLE 19

ZERO-ORDER CORRELATIONS BETWEEN STUDENT ACHIEVEMENT WITHOUT MAKING ALLOWANCES FOR MENTAL ABILITY AND SIX CONTROLLABLE FACTORS

Student Achievement; Correlation with	Pearson r Correlation	Rank-Difference Correlation
Size	.39	.33
Average Salary	.38	.56
Scope	-.08	.41
Average Certification Rank	-.03	.10
Plant	.00	-.09
Administration	-.14	-.06

There appears to be positive relationships between size and achievement and average salary and achievement as evidenced by rank-difference correlations of .33 and .56, respectively. A rank-difference correlation of .41 between scope and achievement indicates a positive relationship. Correlations of .10, -.09, and -.06 for average certification rank, plant, and administration, respectively, indicate negligible relationships with achievement.

Analysis

If it is assumed that a test of mental ability does not measure mental ability, but instead is really a test of academic achievement, then the factors of size, average salary, and scope show positive relationships with student achievement. Factors of average certification rank, plant, and administration indicate negligible relationships. If, on the other hand, it is assumed that the more intelligent people are in larger areas, provide a more varied curriculum for their children, and are more sensitive to the salary needs of teachers, then it can be reasoned that size, salary, and scope are not really related to student achievement, but rather to the type of population which the school serves. In other words, it would probably be a safe assumption that the more intelligent people try to provide a higher standard of "educational" living for their children. Goodenough explained the situation as follows:

> Amount of income, number of books in the home, various measures of social standing, class of neighborhood in which the home is located, size of home and quality of furnishings, and a host of other external factors have been found to be correlated with the intellectual level both of parents and of their children as well. It is not unreasonable to assume that the more intelligent members of the population, other factors being equal, are better able to procure these

> benefits for themselves and for their children than are the less intelligent, who are not so quick to recognize or avail themselves of opportunities, or to foresee the consequences of their acts.[1]

Quality Criteria

In order to determine the relationships of the quality criteria to each other, rank-difference correlations were computed. Table 20 indicates the correlations obtained. The relationship between holding power and the Evaluative Criteria ratings is .24. The correlations of .09 and .05 between holding power and the index of achievement and the Evaluative Criteria and index of achievement, respectively, are considered negligible. Because of the low correlation between the Evaluative Criteria and the index of achievement, the relationship between the two criteria was investigated by additional methods.

TABLE 20

ZERO-ORDER CORRELATIONS OF QUALITY CRITERIA TO EACH OTHER

	Holding Power	Evaluative Criteria	Index of Achievement
Holding Power	1.00	.24	.09
Evaluative Criteria		1.00	.05

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[1] *Ibid.*, p. 256.

A rank-difference correlation was computed between the academic achievement, without taking mental ability into account, and the Evaluative Criteria. A correlation of .09 was obtained. Another technique employed was that of taking a random sampling of fifteen students from each of the seven schools receiving the highest rating on the Evaluative Criteria, and a like number of students with the same psychological score from each of the seven schools receiving the lowest Evaluative Criteria rating. The average scores made by each of these two equated groups on the standardized tests were computed. Table 21 shows the average scores of the "high" and "low" schools in the four subject areas. None of the mean differences was found to be statistically significant.

TABLE 21

AVERAGE SCORES MADE ON STANDARDIZED TESTS BY STUDENTS FROM SEVEN "HIGH" AND SEVEN "LOW" SCHOOLS AS RATED BY THE EVALUATIVE CRITERIA

	English	Social Studies	Natural Sciences	Mathematics
"High" Schools	46.35	27.16	22.62	18.23
"Low" Schools	44.40	28.02	23.35	18.91

Analysis

There seems to be a positive relationship between the holding power of the schools and the ratings received on the Evaluative Criteria. There appears to be no significant relationship between Evaluative Criteria ratings and academic achievement by the students. There appears to be no significant relationship between holding power and the index of achievement.

Summary

A summary of the zero-order and partial correlations between each of the six controllable factors and each of the three criteria of holding power, Evaluative Criteria ratings, and index of achievement is shown in Table 22. Those factors having the most consistent positive partial correlation with all three quality criteria are listed from top to bottom.

The factor showing the most consistent positive relationship with the three quality criteria used is plant. As evidenced by a zero-order correlation of .47 and a partial correlation of .35 plant has the highest positive relationship with the Evaluative Criteria. Plant holds the highest positive relationship with the index of achievement as indicated by a zero-order correlation of .21 and partial correlation of .19. Plant holds the second highest relationship with holding power with a zero-order correlation of .12. The second highest partial correlations are between plant and holding power and between size and holding power as indicated by correlations of .11 each.

TABLE 22

SUMMARY OF ZERO-ORDER AND PARTIAL CORRELATIONS OF THREE QUALITY CRITERIA AND SIX CONTROLLABLE FACTORS

	Holding Power		Evaluative Criteria		Index of Achievement	
	Zero-Order	Partial	Zero-Order	Partial	Zero-Order	Partial
Plant	.12	.11	.47	.33	.21	.19
Administration	-.10	.03	.37	.25	.10	.02
Average Certification Rank	.27	.28	-.01	.01	-.09	-.09
Size	.05	.11	.22	.08	.02	.01
Scope	-.01	-.08	.21	.08	.03	.05
Average Salary	-.14	-.21	.06	-.16	-.08	-.11

Administration holds second place with regard to consistency of positive correlations with the three quality criteria. A zero-order correlation of .37 and a partial correlation of .25 exist between administration and the Evaluative Criteria ratings. Although administration shows a slight positive zero-order correlation of .10 with the index of achievement, the partial correlation is only .02. A slight negative zero-order correlation of -.10 between administration and holding power is changed to a positive .03 when the other five factors are "partialled" out.

A positive relationship exists between certification and holding power as evidenced by a zero-order correlation of .27 and a partial of .28. No positive relationship is indicated between certification and the Evaluative Criteria and between certification and the index of achievement.

The relationship between size and the Evaluative Criteria is indicated by a positive zero-order correlation of .22. This, however, is reduced to .08 when the other five factors are held constant. The relationship indicated by a zero-order correlation of .05 between size and holding power is negligible but increases to .11 when the other five factors are "partialled" out. No relationship is indicated between size and the index of achievement as evidenced by a zero-order correlation of .02 and a partial correlation of .01.

Average salary shows negative relationship with holding power. A zero-order correlation of -.14 between average salary and holding power changes to -.21 when the other five factors are held constant. A negligible relationship between average salary and the Evaluative Criteria ratings is indicated by a correlation of .06. The partial correlation of -.16 between these two variables indicates a negligible relationship. A zero-order correlation of -.08 and a partial of -.11 indicate negligible relationship between average salary and the index of achievement.

If student achievement, without taking mental ability into account, is used as a criterion of quality, then size, salary, and scope show high relationships with the criterion. Correlations for the factors of plant, administration, and certification indicate negligible relationships with student achievement.

There is a positive relationship between the Evaluative Criteria ratings and holding power as indicated by a zero-order correlation of .24. No relationship is evidenced between the Evaluative Criteria ratings and academic achievements. Index of achievement and holding power show no significant relationship.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

This investigation has reviewed some of the major studies in the general field of measuring school quality. It has justified the three selected criteria of holding power, Evaluative Criteria ratings, and the index of achievement used in this study for measuring the quality of forty-five Florida secondary schools. Evidence of the assumption that the six controllable factors of salary, certification, scope, size, administration, and plant affect school quality has been presented. A statistical analysis of the relationships of each of the six controllable factors to each of the three criteria has been made. In addition, correlations were computed between student achievement on standardized tests, without making allowances for differences in mental ability, and each of the six controllable factors. The statistical relationships of each of the three quality criteria to each other were presented. In succeeding paragraphs, partial correlations refer to the relationships between each of the controllable factors, the other five being held constant, and the criteria indicated.

The findings of this investigation briefly summarized are as follows:

1. The highest degree of consistent relationship with the three quality criteria is evidenced by plant. A zero-order correlation of .47 and a partial correlation of .33 were found between plant and the Evaluative Criteria. A zero-order correlation of .21 and a partial correlation of .19 were found between plant and the index of achievement. Although a negligible relationship appears to exist between plant and holding power, the zero-order correlation of .12 and the partial correlation of .11 are the second highest correlations derived from the six factors used.
2. Administration shows a fairly high degree of relationship with the Evaluative Criteria as evidenced by a zero-order correlation of .37 and a partial correlation of .25. Correlations between administration and the two criteria of holding power and index of achievement are considered negligible.

3. Certification holds the highest correlation with holding power as evidenced by a zero-order r of .27 and a partial r of .23. There appears to be no relationship between certification and the Evaluative Criteria ratings and between certification and the index of achievement.
4. Although the factors of size and scope show zero-order correlations of .22 and .21, respectively, with the Evaluative Criteria, the partial correlations are only .08 and .08. No appreciable relationships between the two factors of size and scope and the other two quality criteria were found.
5. Relationships seem to be negligible between average salary and quality as measured by the Evaluative Criteria and the index of achievement. A possible negative relationship exists between average salary and holding power as evidenced by a zero-order correlation of -.14 and a partial correlation of -.21.
6. Factors of size, salary, and scope yield rank-difference correlations of .33, .56,

and .41, respectively, with student achievement (not taking mental ability into account) on standardized subject matter tests. There appears to be no relationship between the factors of certification, plant, and administration and the criteria of student achievement.

7. Some relationship seems to exist between the Evaluative Criteria ratings and holding power as evidenced by a rank-difference correlation of .24. There appears to be no relationship between Evaluative Criteria ratings and the index of achievement as measured by standardized tests. A rank-difference correlation of .09 between index of achievement and holding power indicates a negligible relationship between these two criteria.

Conclusions

The statistical results of this investigation are interpreted with regard to correlation trends rather than with regard to the significance of coefficients of correlation for prediction purposes. In other words, conclusions reached pertain only to the schools investigated and only at the present time. It would seem that the most reasonable interpretation that could be given to the relationship of each of the six factors with each of the quality criteria would fall into three categories as follows: (1) a factor may not have reached the "effectiveness" stage in regard to yielding a valid correlation with the criteria used; (2) a factor may be in the "effectiveness" stage but not contain sufficient variability to permit a high correlation; (3) a factor may be in the "effectiveness" stage and possess enough variability to produce a high correlation. With this interpretation in mind, the following conclusions are reached:

1. There appears to be a definite relationship between plant and Evaluative Criteria ratings and between plant and the index of achievement. This seems to indicate that those schools with better plant facilities utilize better educational practices and that the student achievement, commensurate with mental ability, is higher. The statistically negligible relationship of plant to holding power may indicate a temporary plateau rather than lack of relationship.
2. There appears to be a definite relation-

ship between the quality of administration and the Evaluative Criteria ratings. This relationship seems to indicate that in general those schools with good administrative practices also possess all around good educational practices. The low coefficients between administration and the two criteria of holding power and index of achievement may indicate that a temporary plateau has been reached.

3. The relationship between certification and holding power is higher than that of any of the other variables and holding power. This seems to imply that the schools with better trained faculties have the greatest holding power. A temporary plateau may exist with regard to the relationship between certification and the Evaluative Criteria and with regard to the relationship between certification and the index of achievement.
4. The relationships between average salary and the Evaluative Criteria and between average salary and the index of achievement are negligible. The correlation

between average salary and holding power is negative. Although the latter relationship could be interpreted statistically as being "the less you pay the more you get," common sense indicates that the salary variable has not reached the stage of "effectiveness" with regard to high salaries drawing superior personnel.

5. The relatively high statistical relationships between each of the three factors of size, scope, and salary and student achievement on standardized tests, without making allowances for differences in mental ability as measured by the psychological tests, can be interpreted as follows: (1) a true relationship appears to exist between the three factors and student achievement, or (2) the real relationship is between the type of community and the three factors. In view of the high correlation of .88 between the four areas of subject matter and mental ability, and the negligible correlations between the three factors and the index of achievement, it would seem more reasonable to assume

that the second interpretation is the more valid one.

6. The relationship between the Evaluative Criteria ratings and holding power indicates that the schools with better educational practices seem to have greater holding power. There appears to be no relationship between the Evaluative Criteria ratings and student achievement.

Suggestions for Further Study

This investigation has revealed a need for the following studies:

1. The base of this study should be expanded to include a greater number and a wider variety of schools. Non-accredited schools as well as those accredited should be included.
2. An investigation should be made of the effectiveness of teacher training by measuring the quality of instruction in a population possessing a wide range of certification rank.
3. An analysis should be made of the relationship between the educational level,

I. Q., occupations, and similar factors of the school patrons and school quality.

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BIOGRAPHICAL ITEMS

Vincent McGuire was born in Harrison, New York, on April 6, 1919. He was graduated from Harrison High School in June, 1936, received his Bachelor of Science degree from New York University in June, 1940, and his Master of Arts degree from Teachers College, Columbia University in June, 1941.

Mr. McGuire taught in the public schools of Harrison and Rye, New York, during 1940-1941. After working in the production department of Chance-Vought Aircraft, he was commissioned an ensign in April, 1942, and was released from active service in February, 1946, as a lieutenant. He served with the War Assets Administration and then resigned to teach in Zephyrhills, Florida, during 1946-1947. The following year he was senior sponsor and core teacher at the P. K. Yonge Laboratory School, University of Florida. From July, 1948 to September, 1950, Mr. McGuire was an instructor in the College of Education, University of Florida. He was granted a leave of absence the following year to complete his doctor's study.

He served as treasurer and president of Beta Xi Chapter, Phi Delta Kappa, and is a member of Kappa Phi Kappa. He is also a member of Kappa Delta Pi, educational honor society.

Mr. McGuire married Emma Rose Wingate in June, 1942. They have three sons--Michael, Stephen, and Joseph.

This dissertation was prepared under the direction of the Chairman of the candidate's Supervisory Committee and has been approved by all members of the Committee. It was submitted to the Graduate Council and was approved as partial fulfilment of the requirements for the degree of Doctor of Education.

June 11, 1951

T. M. Simpson
Dean

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